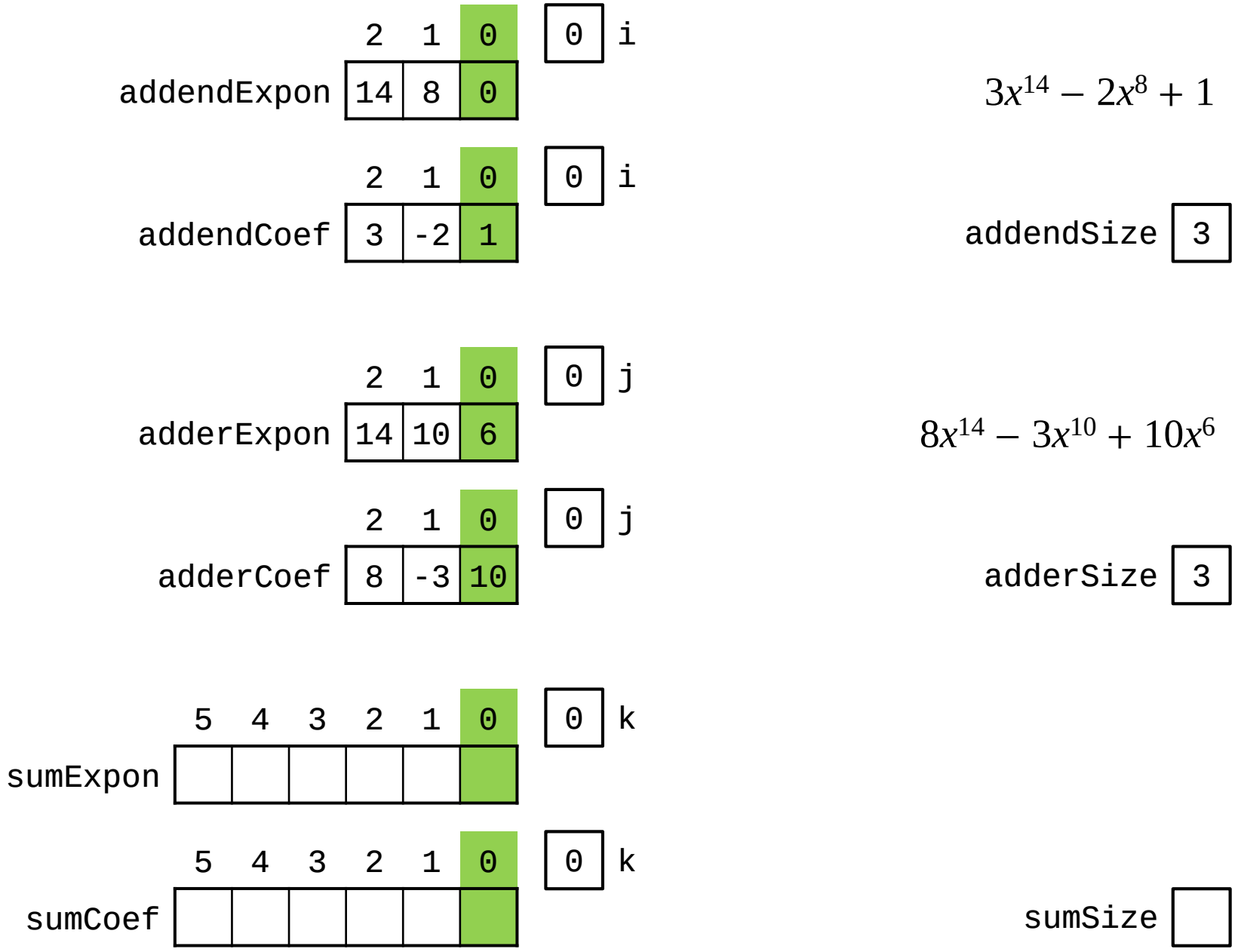
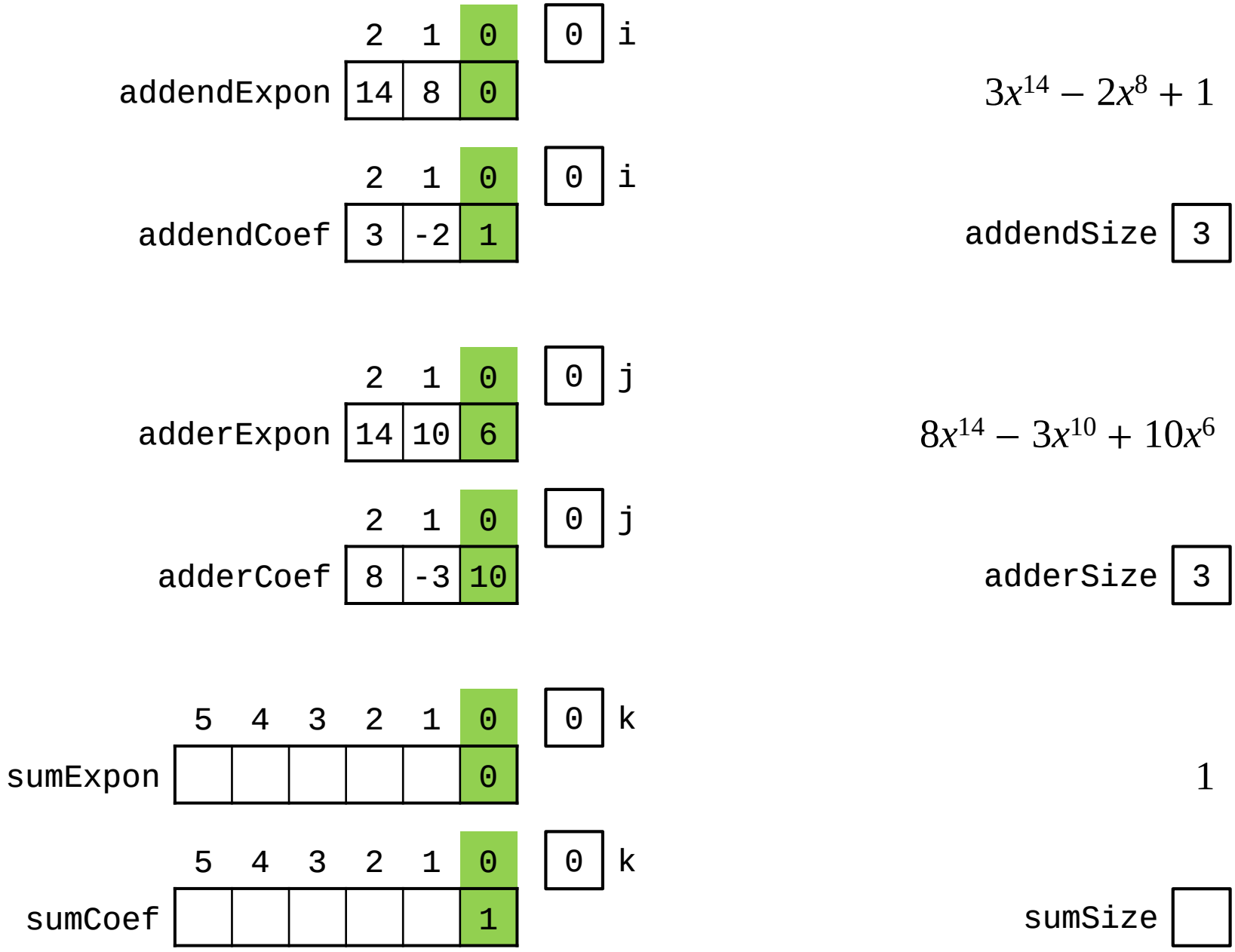
Assignment 6

Addition


2 1 0
0 i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
0 i
addendCoef
3 -2 1
addendSize 3
2 1 0
0 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
0 k
sumExpon
5 4 3 2 1 0
0 k
sumCoef
sumSize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0 i
addendExpon
14 8 0
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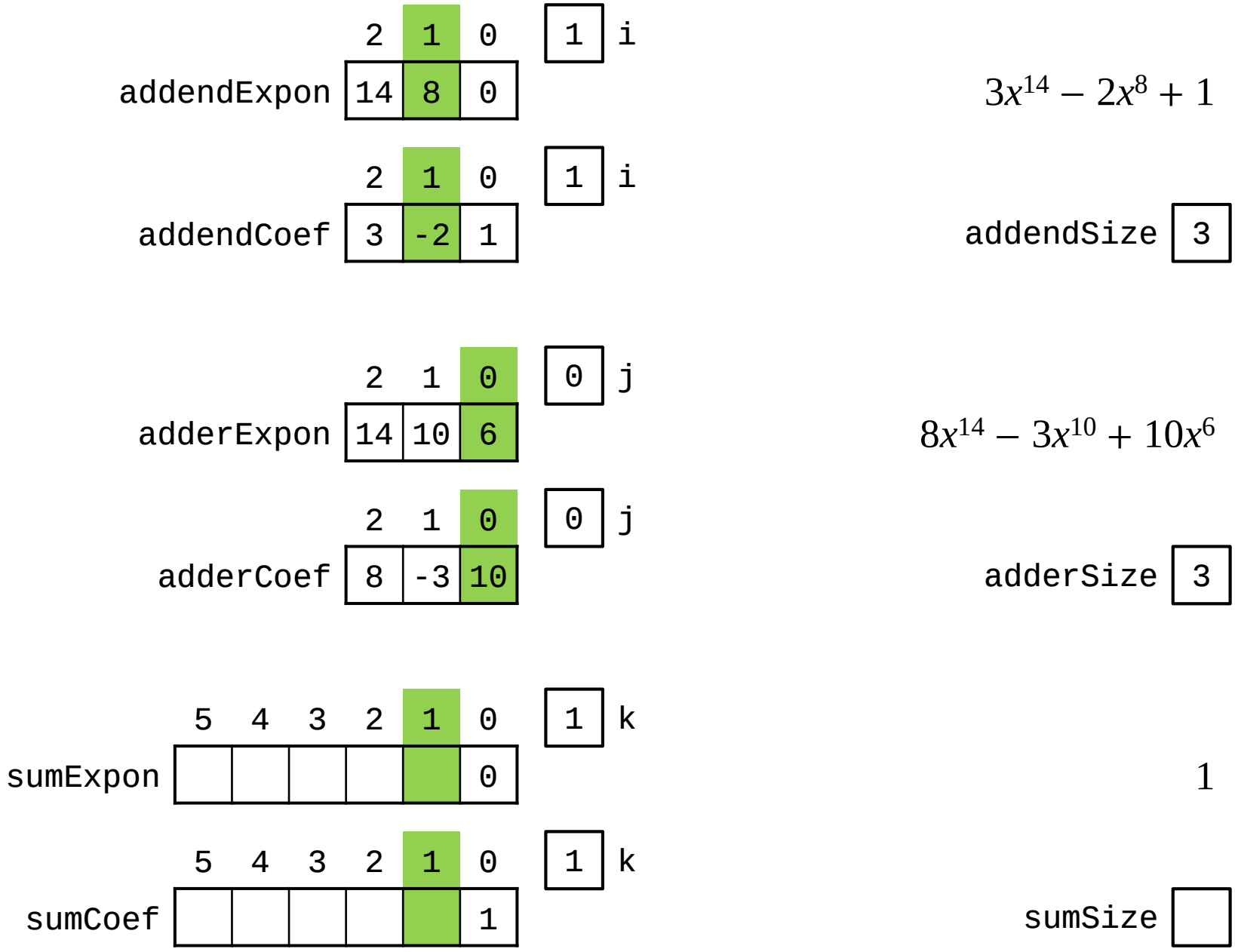
2 1 0
0 i
addendCoef
3 -2 1
addendSize 3
2 1 0
0 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
0 k
sumExpon
0
1
5 4 3 2 1 0
0 k
sumCoef
1
sumSize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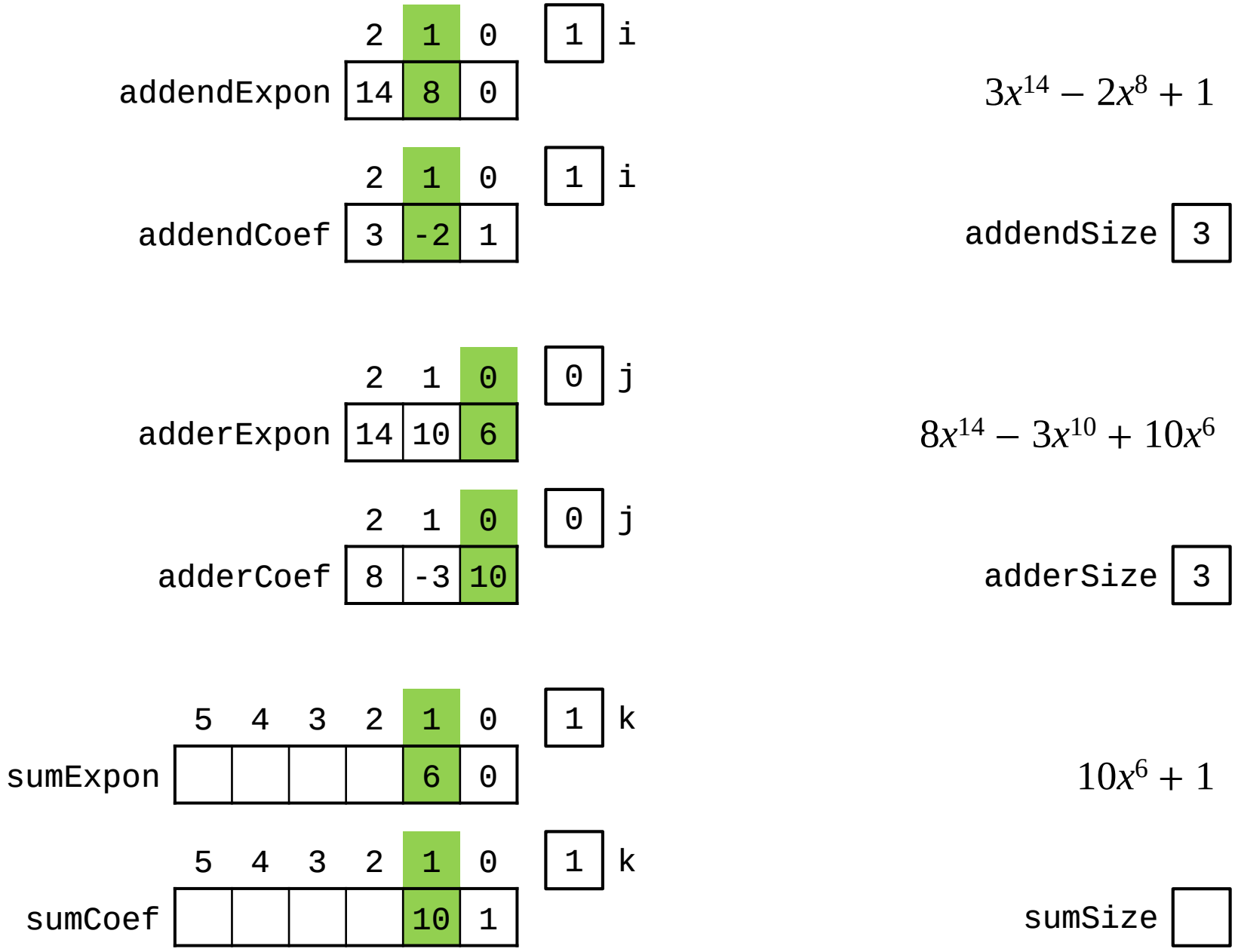
i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
3 -2 1
addendSize
3
2 1 0
0
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
1
k
sumExpon
0
1
5 4 3 2 1 0
1
k
sumCoef
1
sumSize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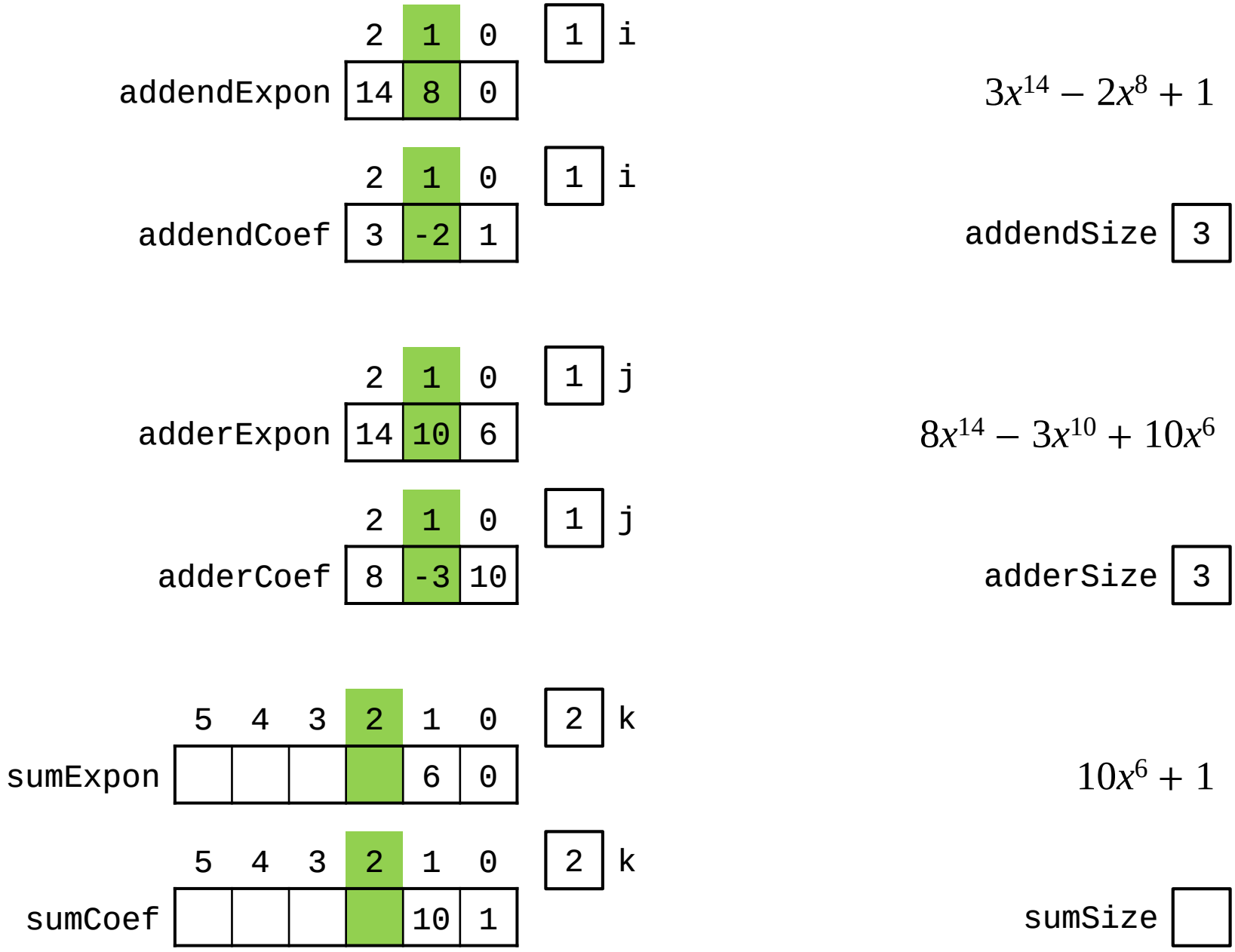
i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
3 -2 1
addendSize
3
2 1 0
0
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
1
k
sumExpon
6 0
$10x^6 + 1$
5 4 3 2 1 0
1
k
sumCoef
10 1
sumSize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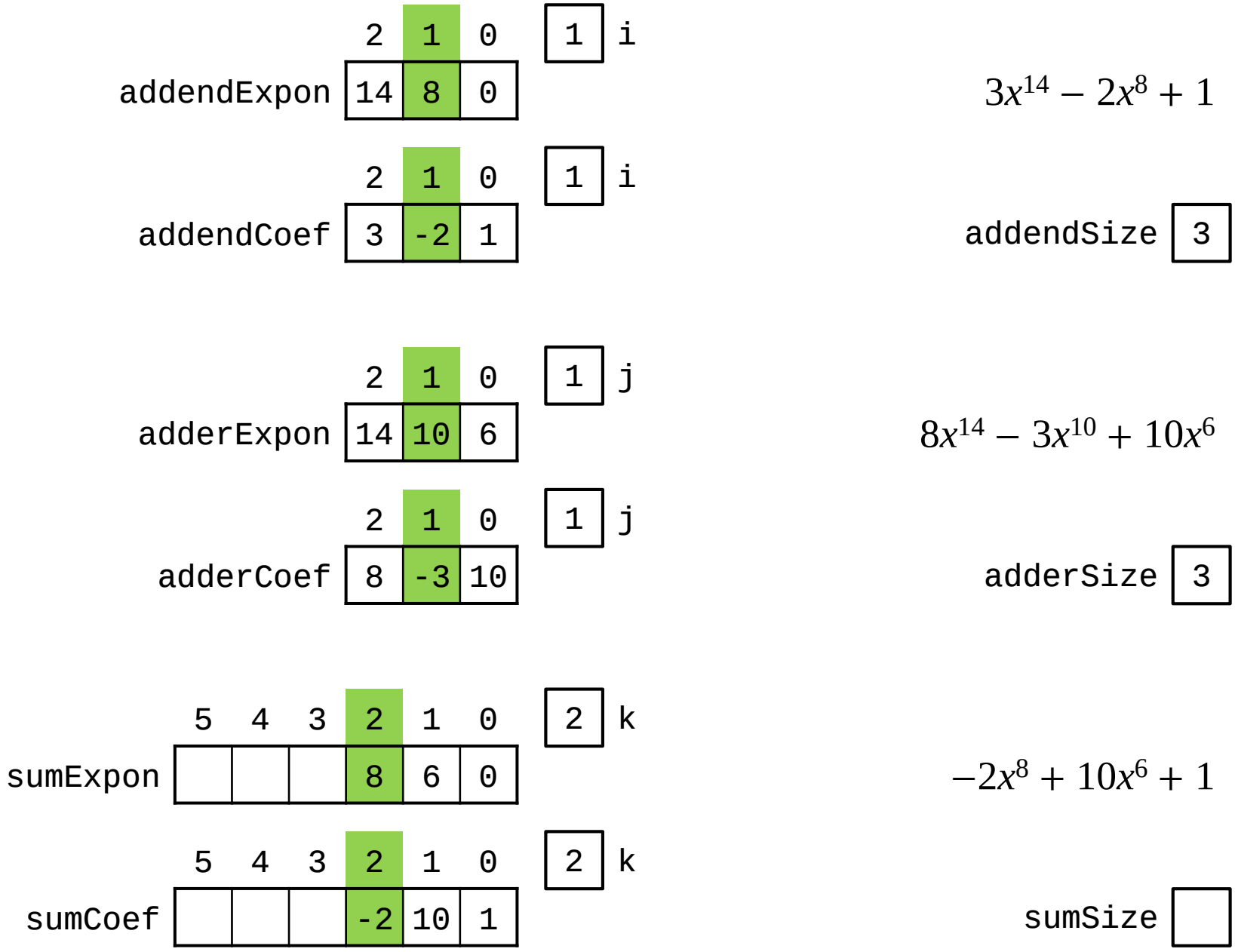
$3x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
3 -2 1
addendSize
3
2 1 0
1
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
1
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
2
k
sumExpon
6 0
$10x^6 + 1$
5 4 3 2 1 0
2
k
sumCoef
10 1
sumSize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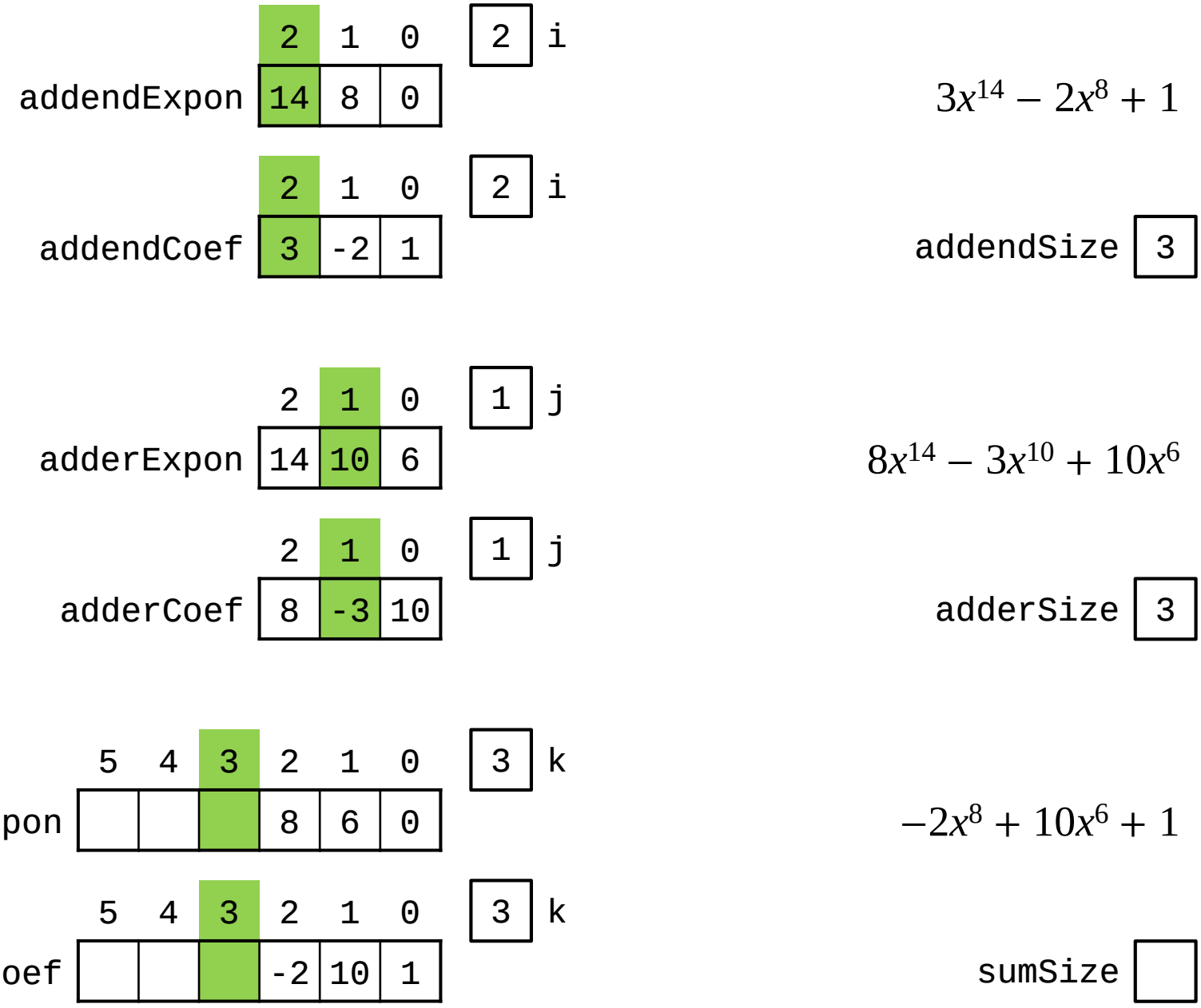
i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
3 -2 1
addendSize
3
2 1 0
1
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
1
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
2
k
sumExpon
8 6 0
$-2x^8 + 10x^6 + 1$
5 4 3 2 1 0
2
k
sumCoef
-2 10 1
sumSize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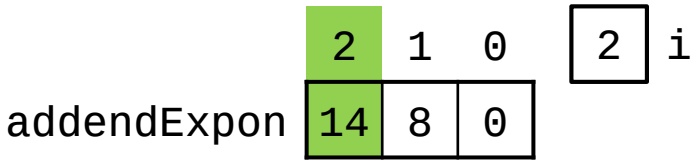
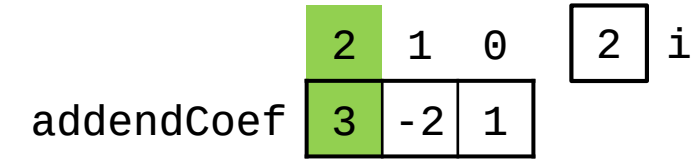
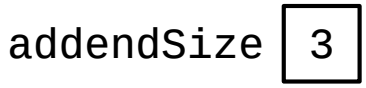
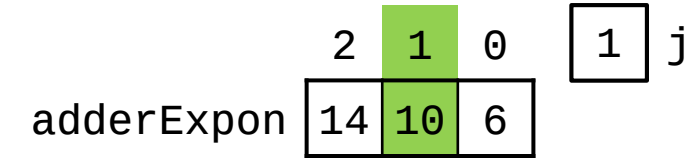
2 i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
3 -2 1
addendSize 3
2 1 0
1 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
1 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
3 k
sumExpon
8 6 0
$-2x^8 + 10x^6 + 1$
5 4 3 2 1 0
3 k
sumCoef
-2 10 1
sumSize



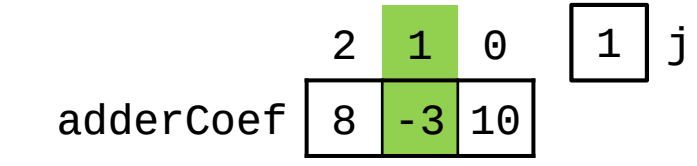
$3x^{14} - 2x^8 + 1$

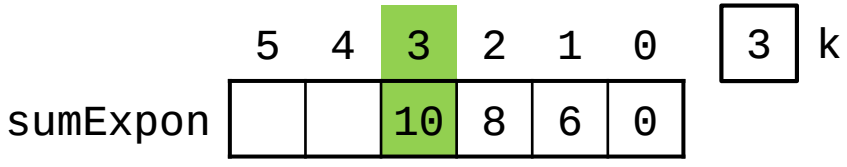




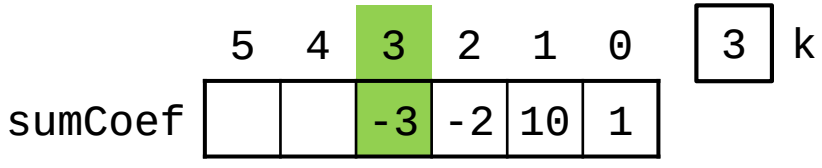


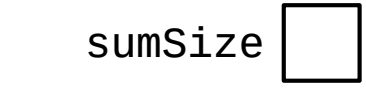
$8x^{14} - 3x^{10} + 10x^6$

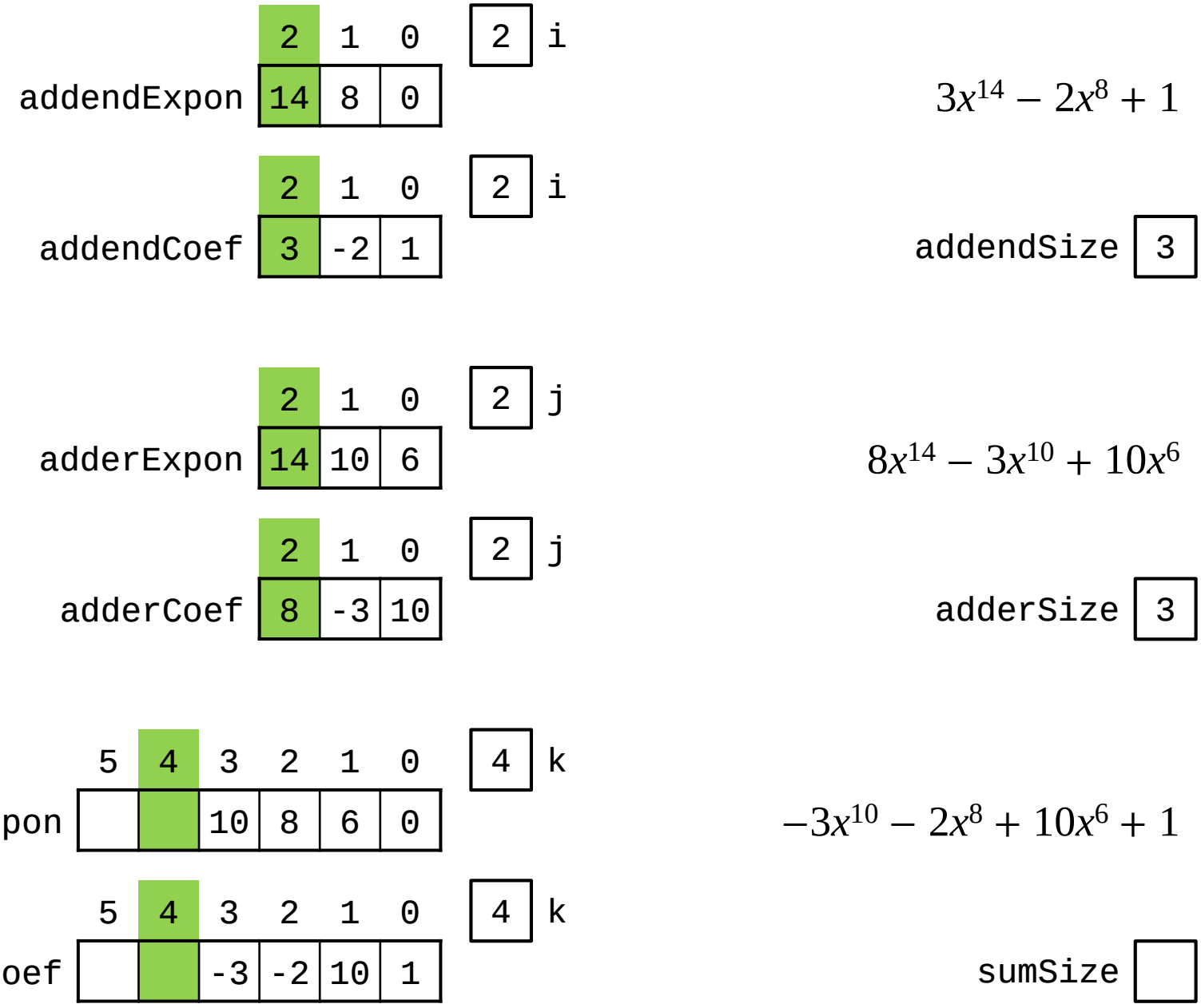


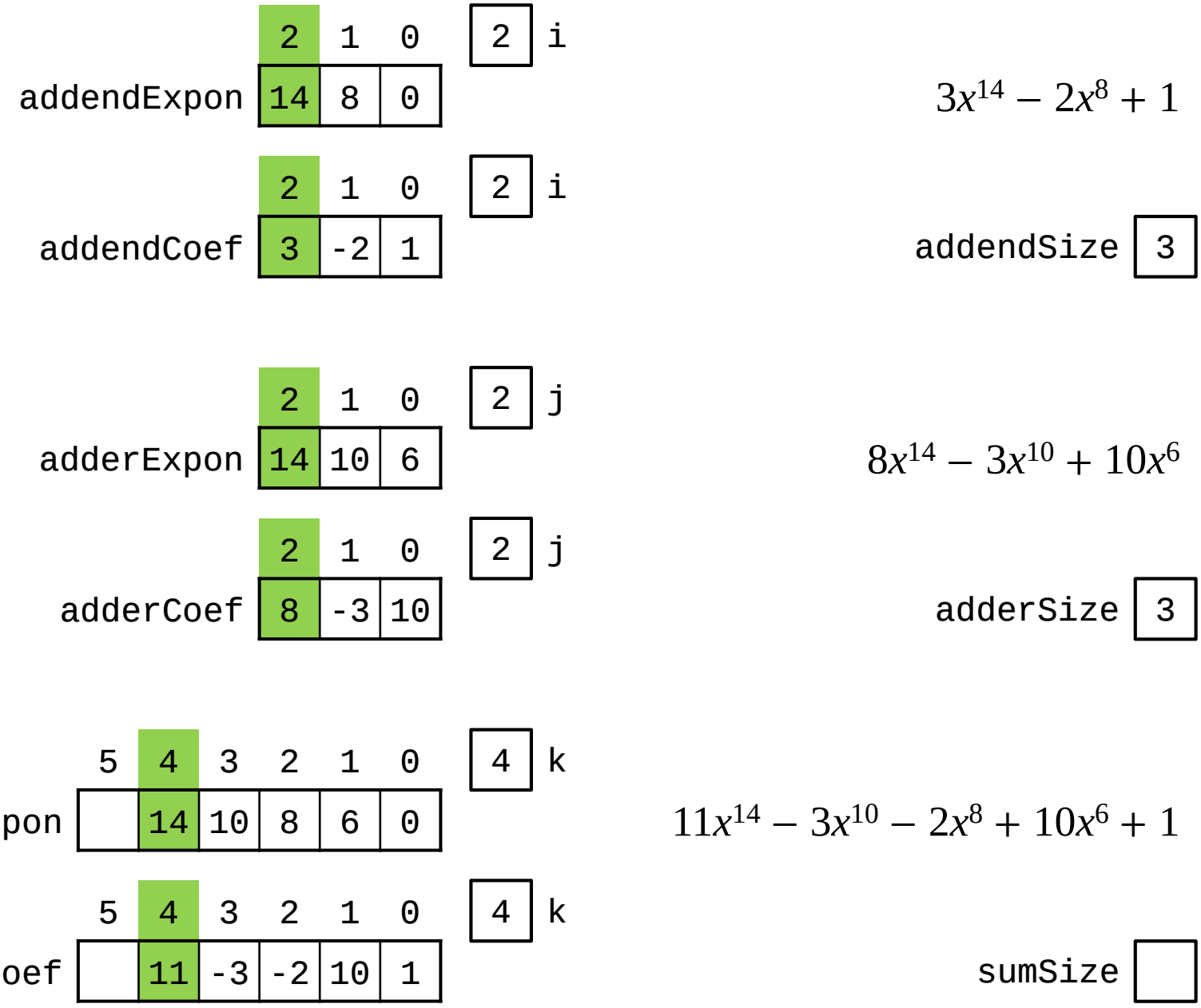


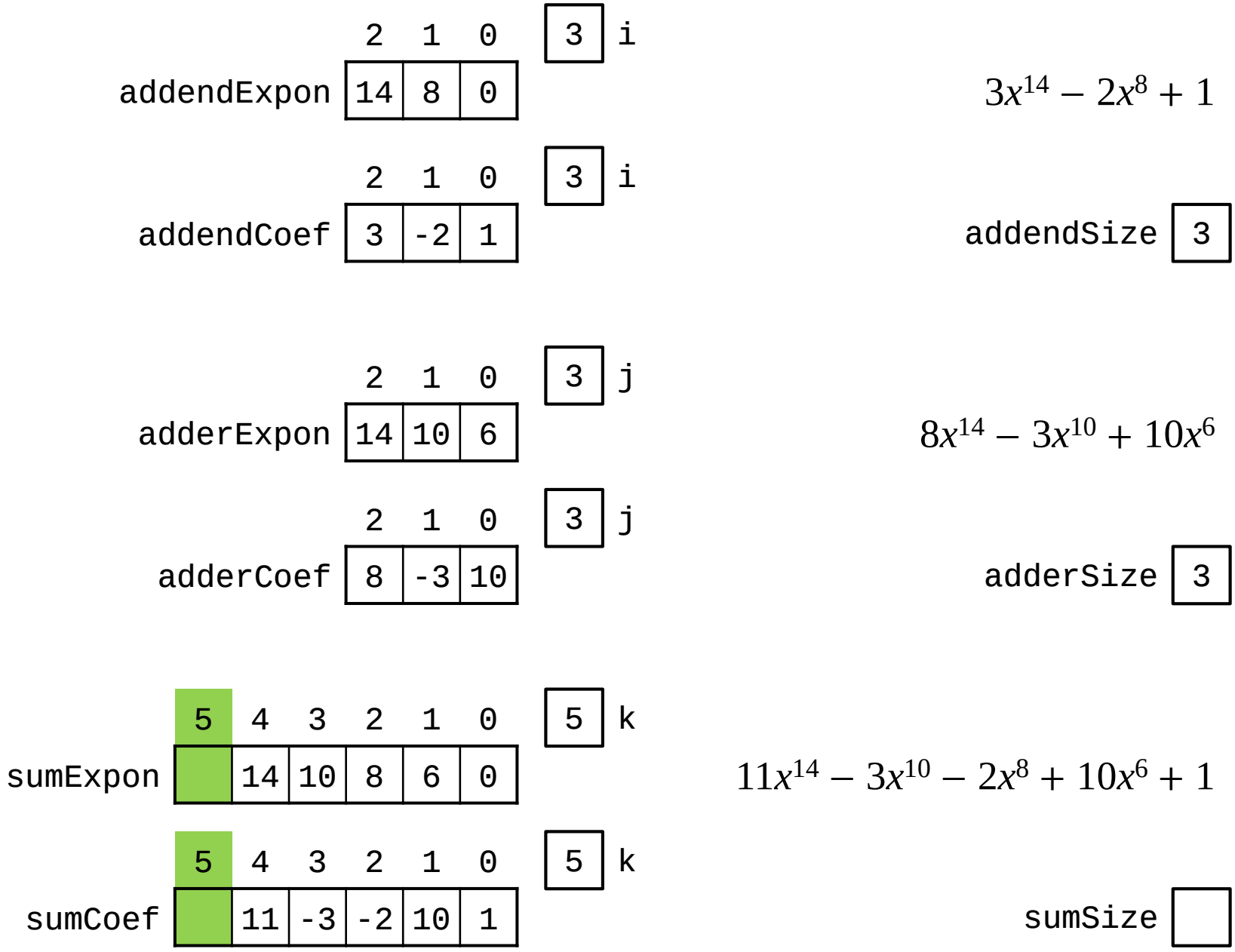
$-3x^{10} - 2x^8 + 10x^6 + 1$

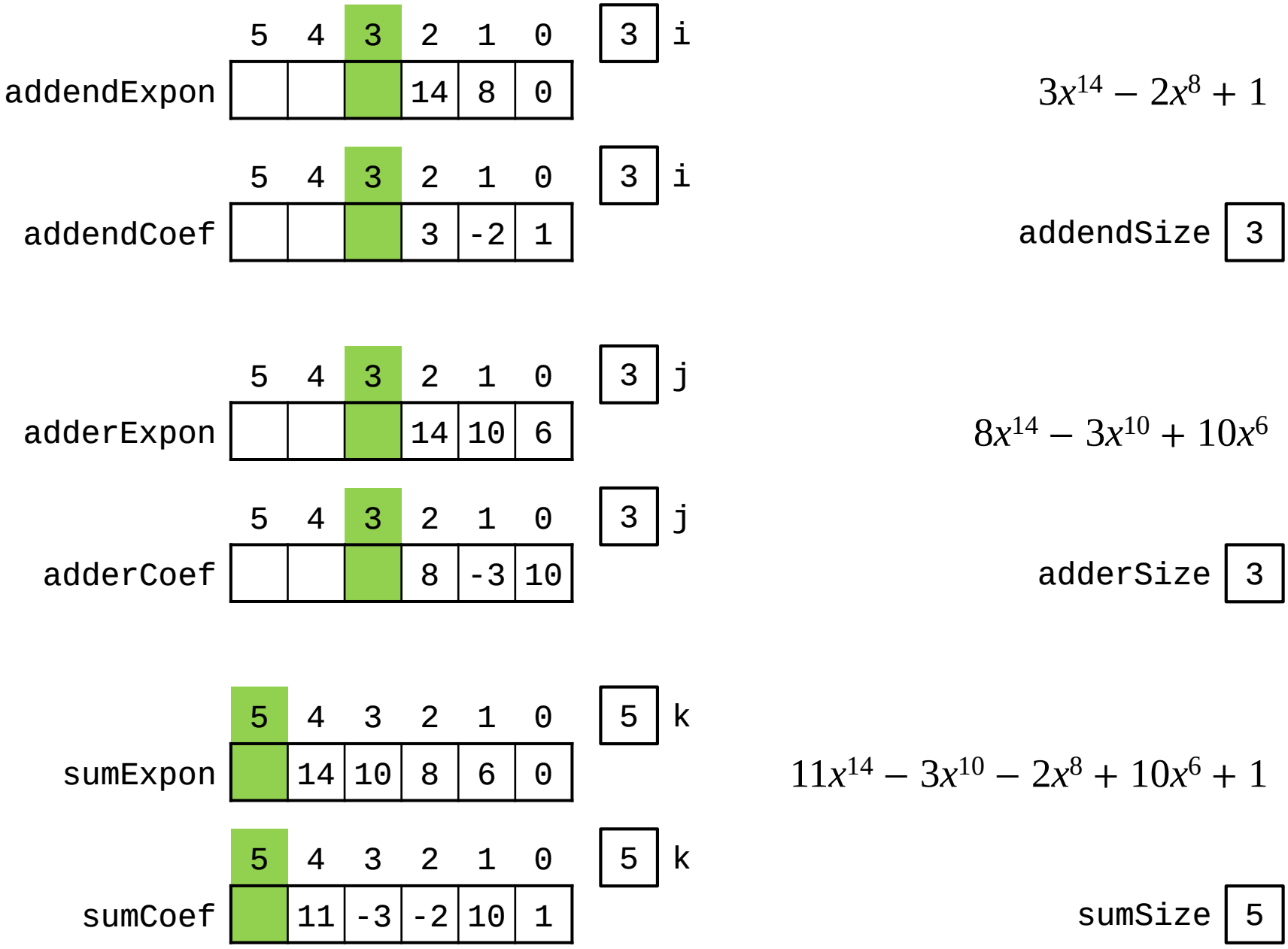


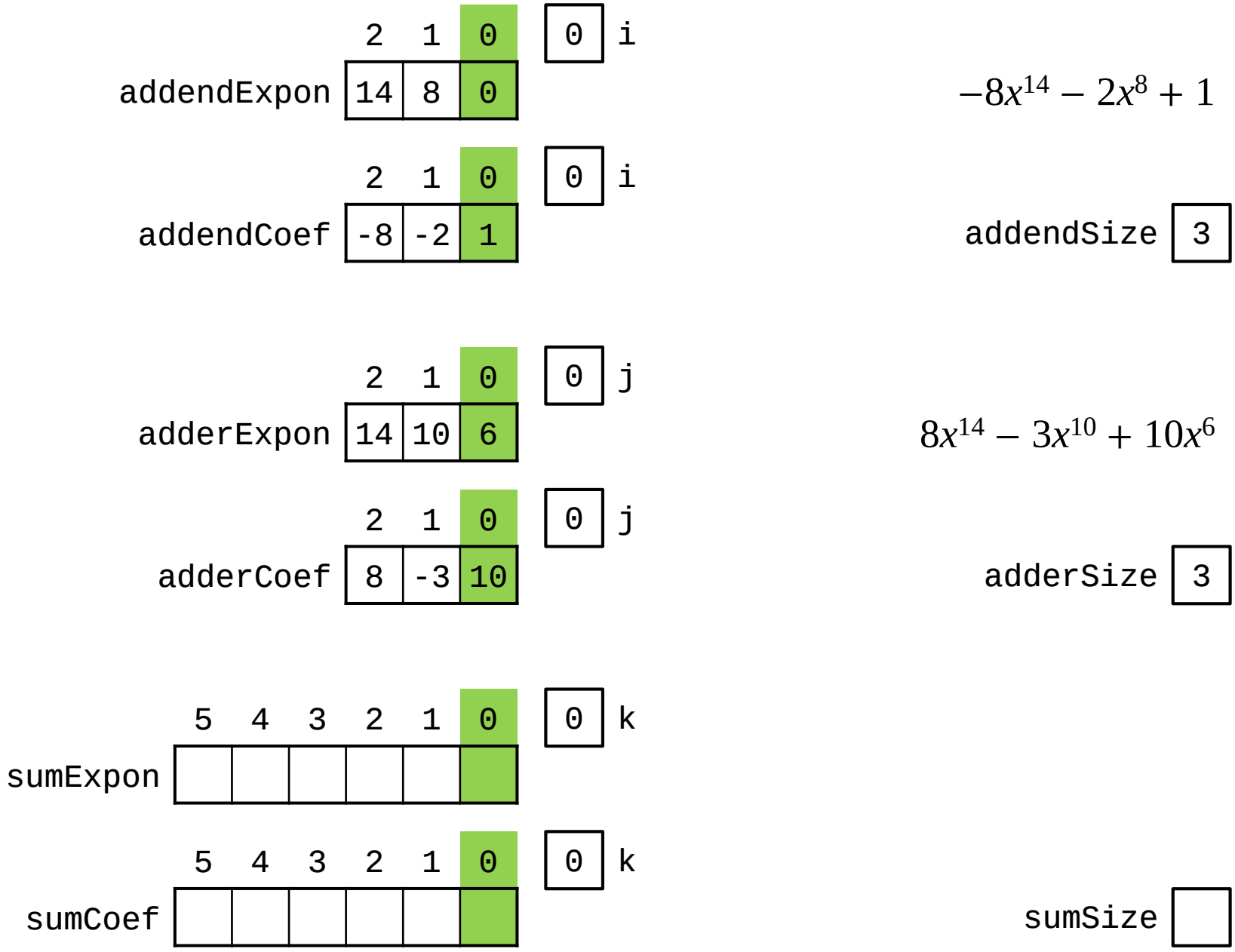


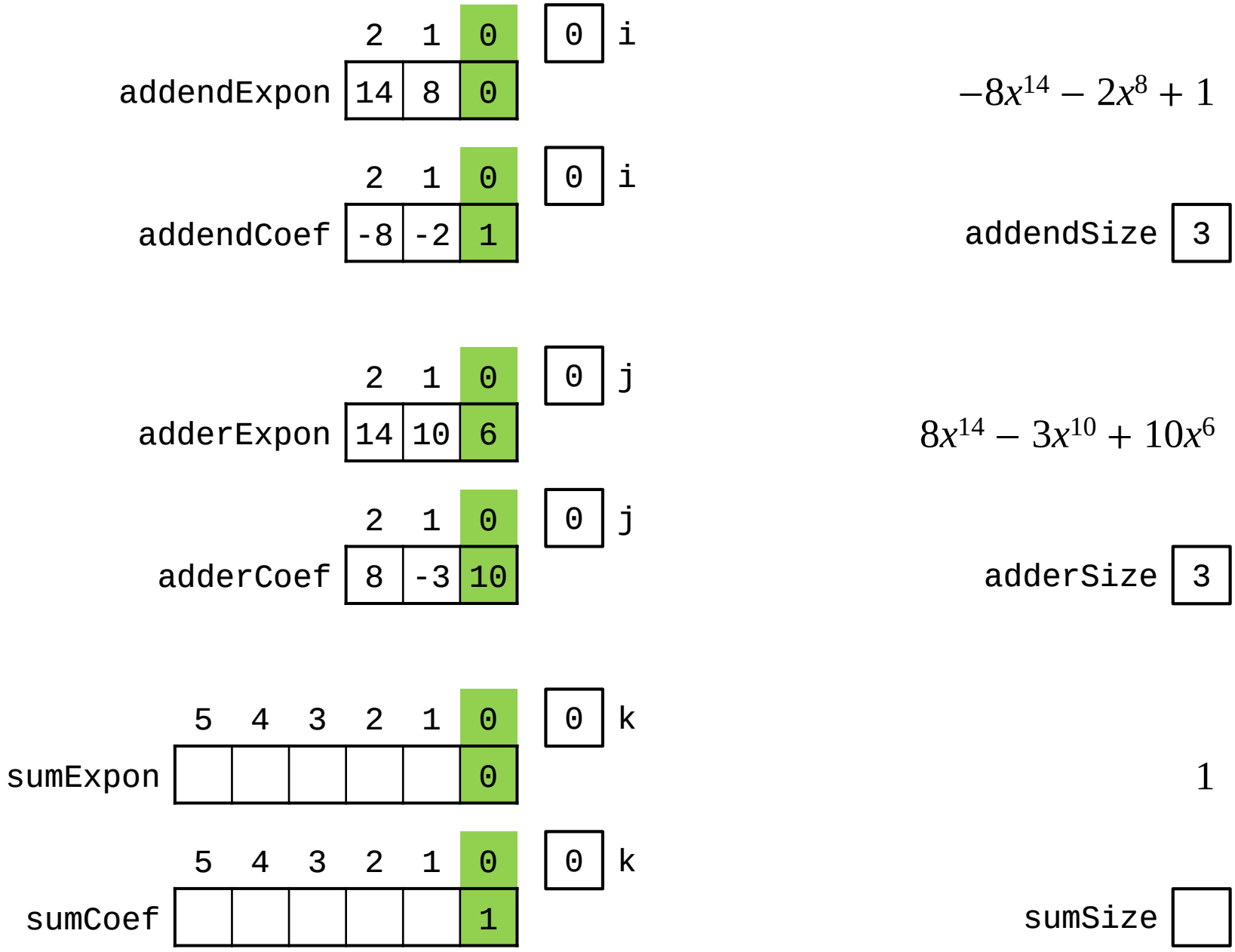

2 1 0
2 i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
3 -2 1
addendSize 3
2 1 0
2 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
2 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
4 k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4 k
sumCoef
-3 -2 10 1
sumSize


2 1 0
2 i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
3 -2 1
addendSize 3
2 1 0
2 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
2 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
4 k
sumExpon
14 10 8 6 0
$11x^{14} - 3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4 k
sumCoef
11 -3 -2 10 1
sumSize


2 1 0
3
i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
2 1 0
3
i
addendCoef
3 -2 1
addendSize
3
2 1 0
3
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
3
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
5
k
sumExpon
14 10 8 6 0
$11x^{14} - 3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
5
k
sumCoef
11 -3 -2 10 1
sumSize


5 4 3 2 1 0
3
i
addendExpon
14 8 0
$3x^{14} - 2x^8 + 1$
5 4 3 2 1 0
3
i
addendCoef
3 -2 1
addendSize
3
5 4 3 2 1 0
3
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
5 4 3 2 1 0
3
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
5
k
sumExpon
14 10 8 6 0
$11x^{14} - 3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
5
k
sumCoef
11 -3 -2 10 1
sumSize
5


2 1 0
0 i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
0 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
0 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
0 k
sumExpon
5 4 3 2 1 0
0 k
sumCoef
sumSize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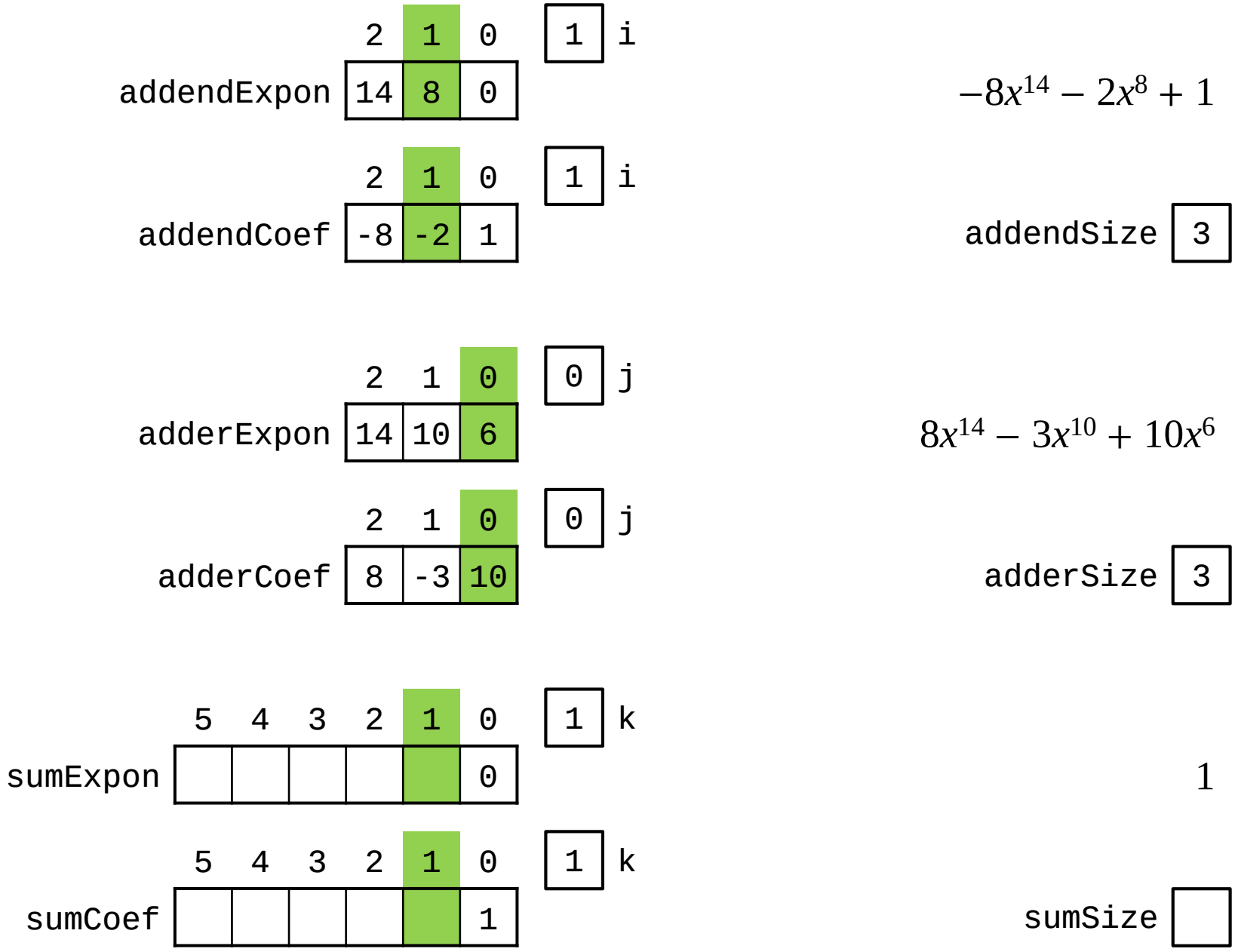
$-8x^{14} - 2x^8 + 1$
2 1 0
0 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
0 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
0 k
sumExpon
0
1
5 4 3 2 1 0
0 k
sumCoef
1
sumSize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1
i
addendExpon
14 8 0
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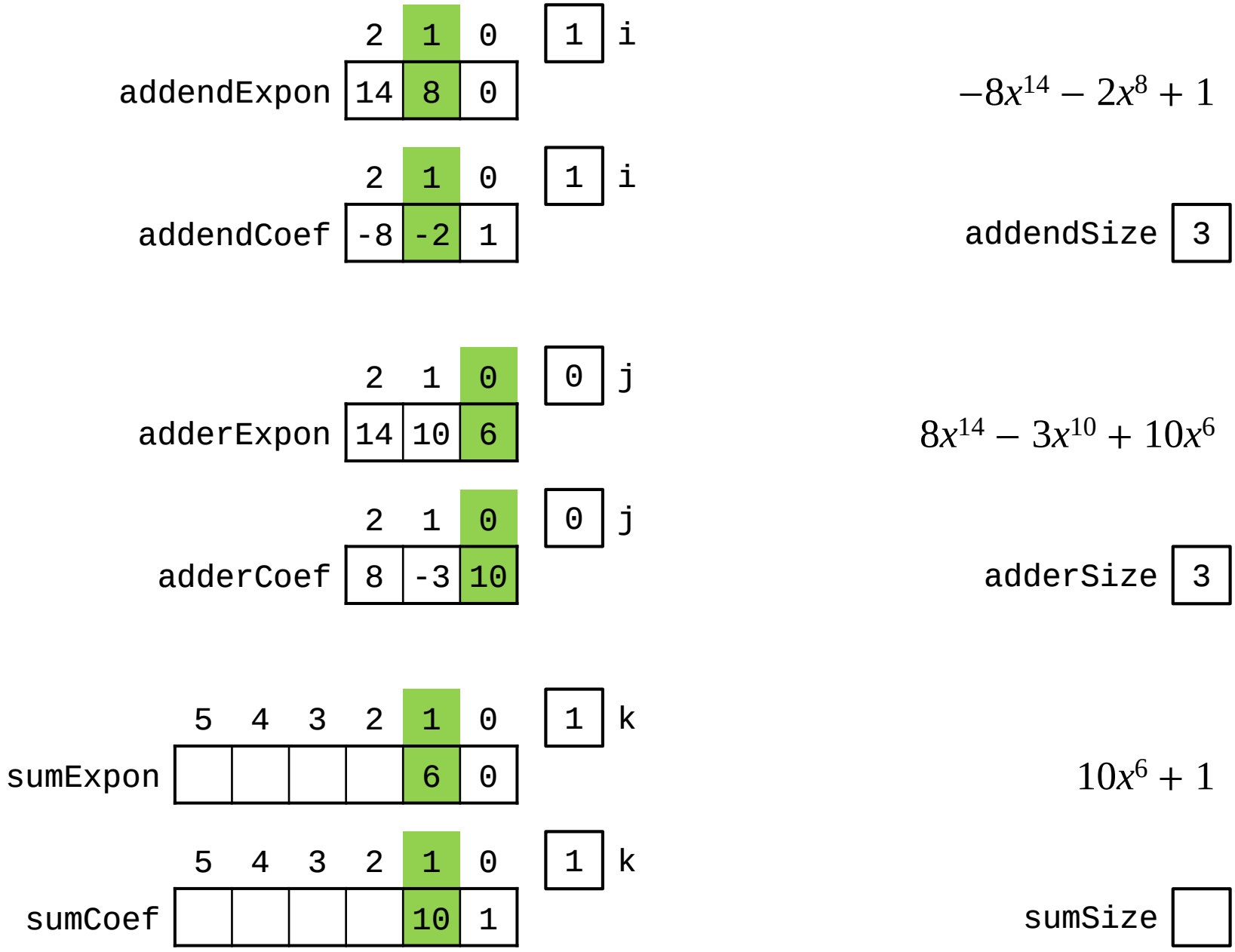
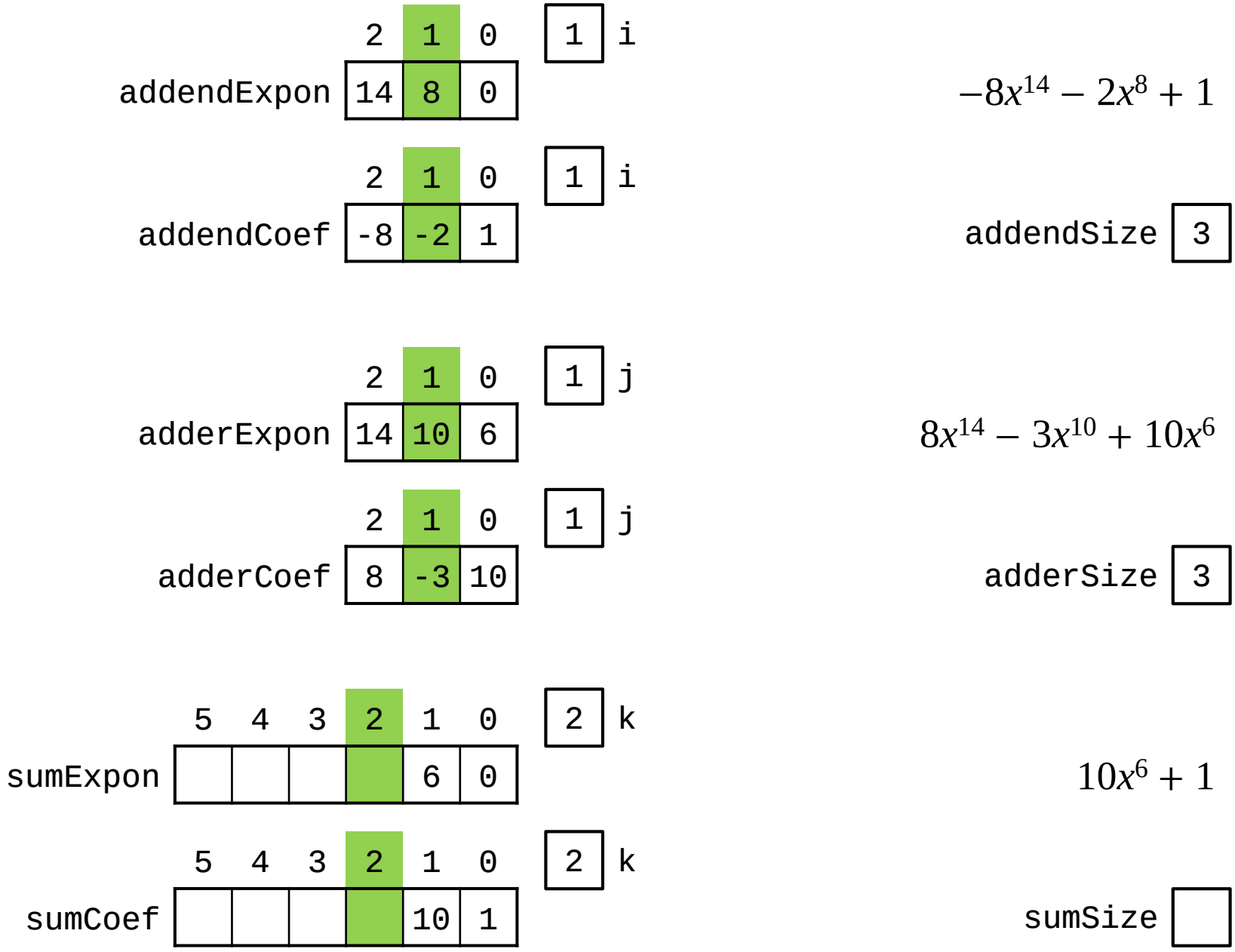
2 1 0
1
i
addendCoef
-8 -2 1
addendSize
3
2 1 0
0
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
1
k
sumExpon
0
1
5 4 3 2 1 0
1
k
sumCoef
1
sumSize


2 1 0
1
i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
-8 -2 1
addendSize
3
2 1 0
0
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
0
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
1
k
sumExpon
6 0
$10x^6 + 1$
5 4 3 2 1 0
1
k
sumCoef
10 1
sumSize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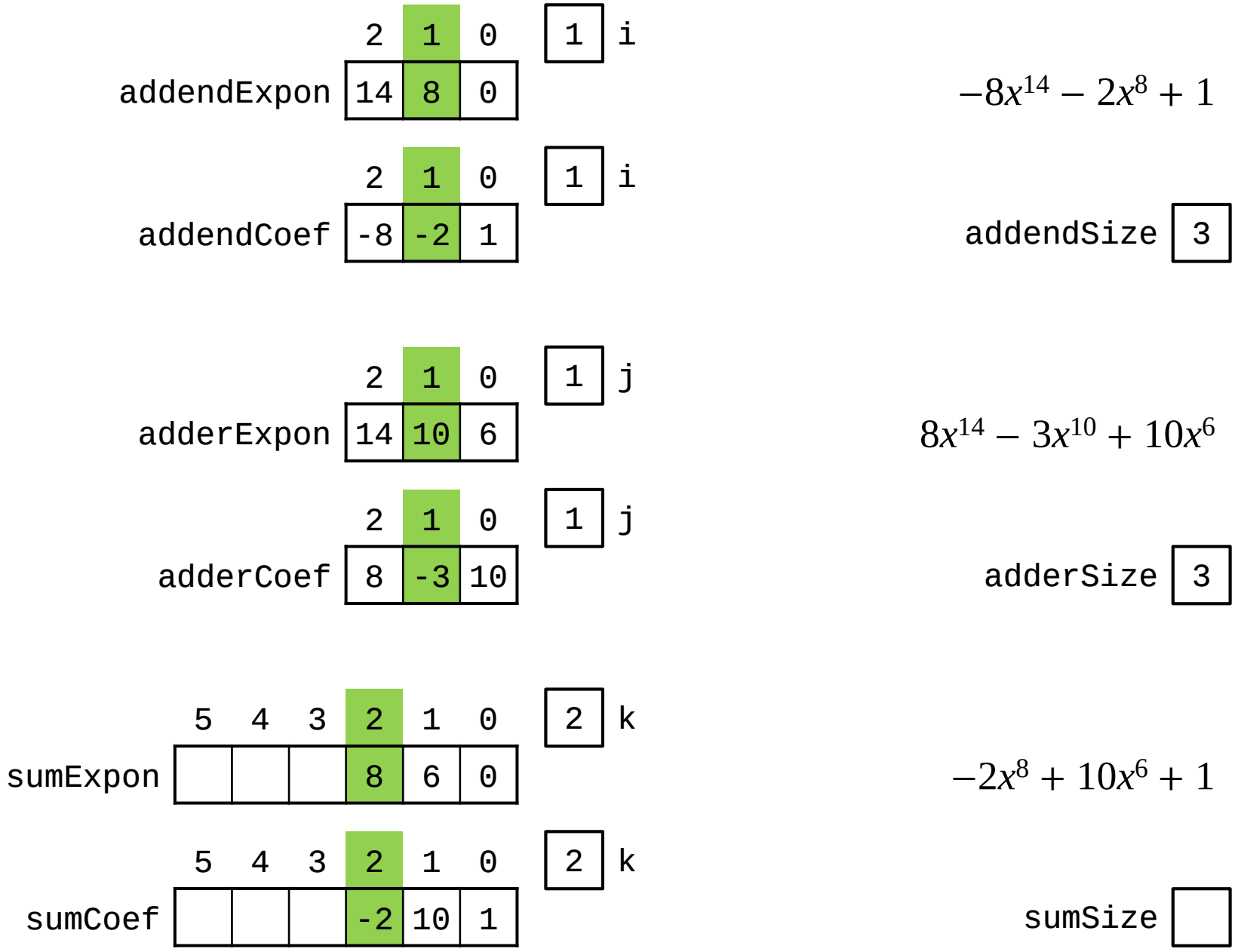
2 1 0
1 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
1 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
1 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
2 k
sumExpon
6 0
$10x^6 + 1$
5 4 3 2 1 0
2 k
sumCoef
10 1
sumSize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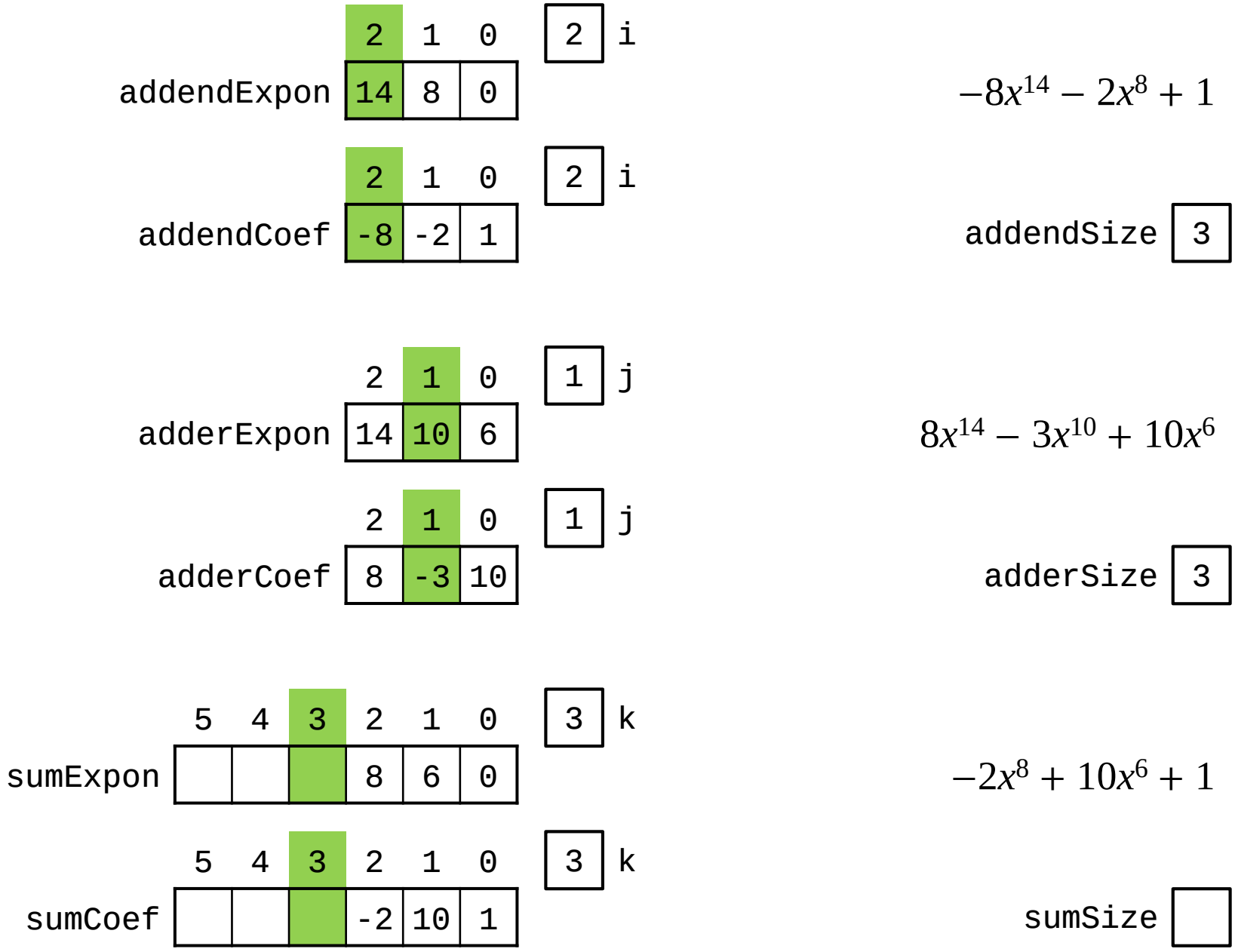
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
1
i
addendCoef
-8 -2 1
addendSize
3
2 1 0
1
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
1
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
2
k
sumExpon
8 6 0
$-2x^8 + 10x^6 + 1$
5 4 3 2 1 0
2
k
sumCoef
-2 10 1
sumSize


2 1 0
2 i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
1 j
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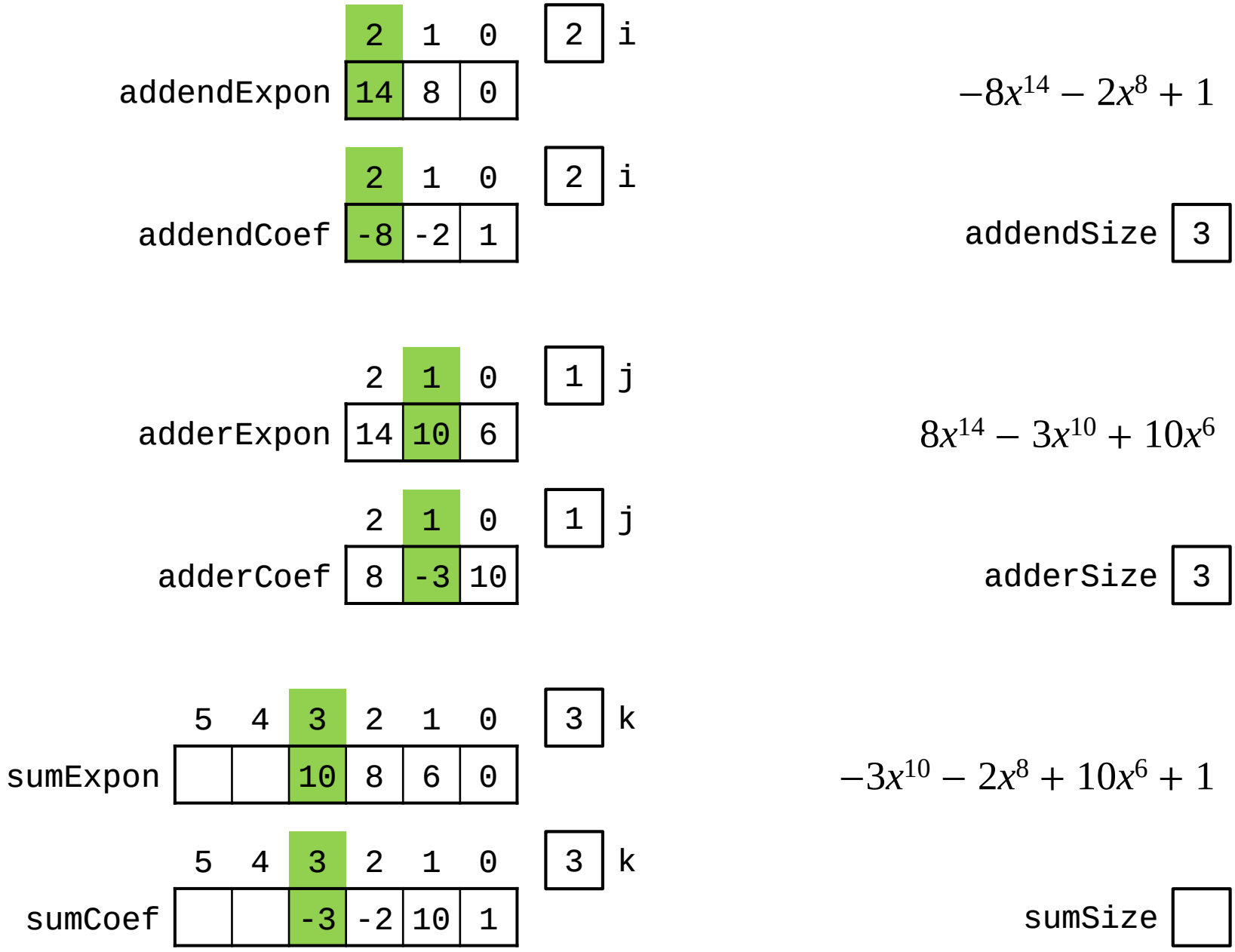
2 1 0
1 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
3 k
sumExpon
8 6 0
$-2x^8 + 10x^6 + 1$
5 4 3 2 1 0
3 k
sumCoef
-2 10 1
sumSize


2 1 0
2 i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
1 j
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2 1 0
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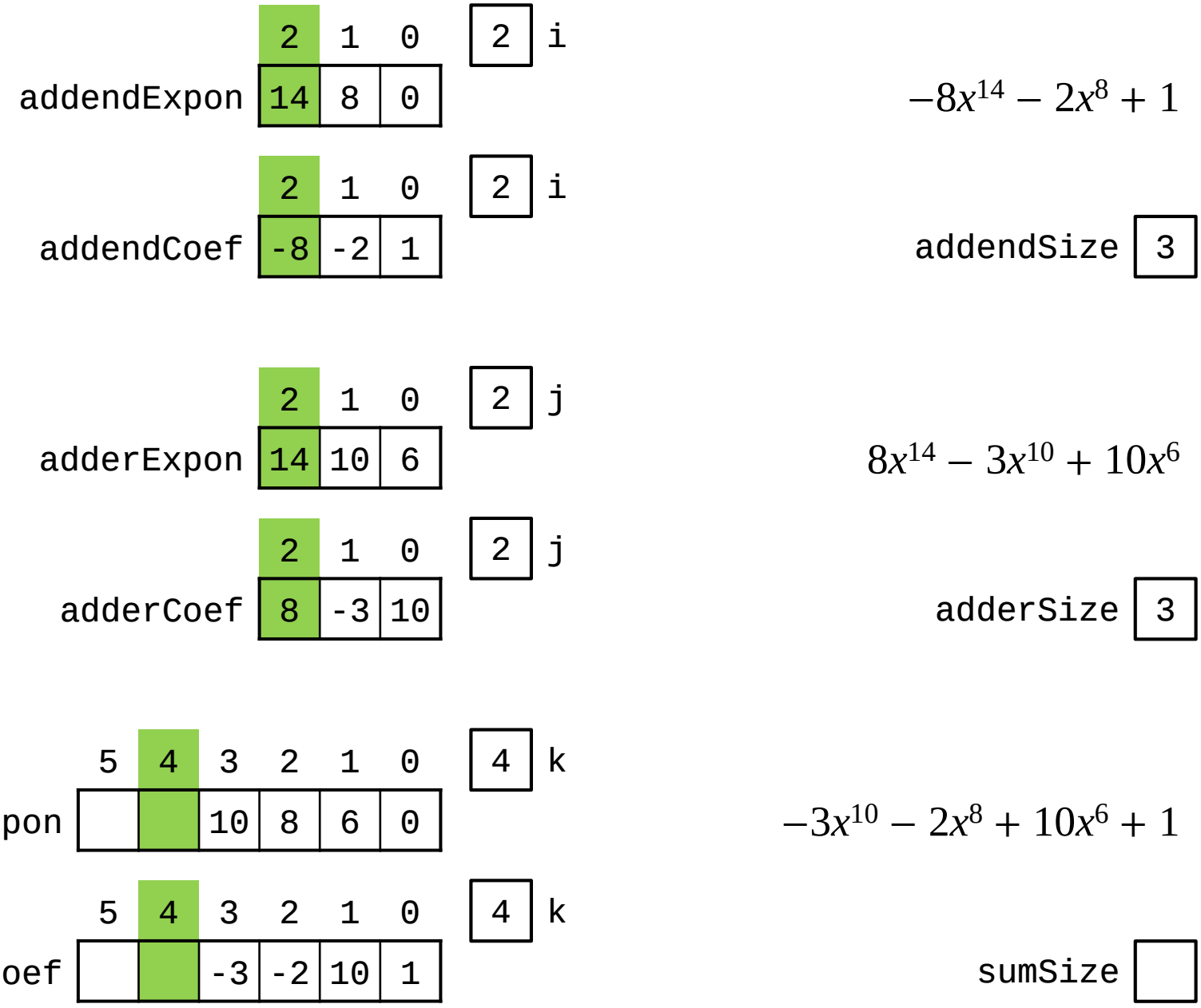
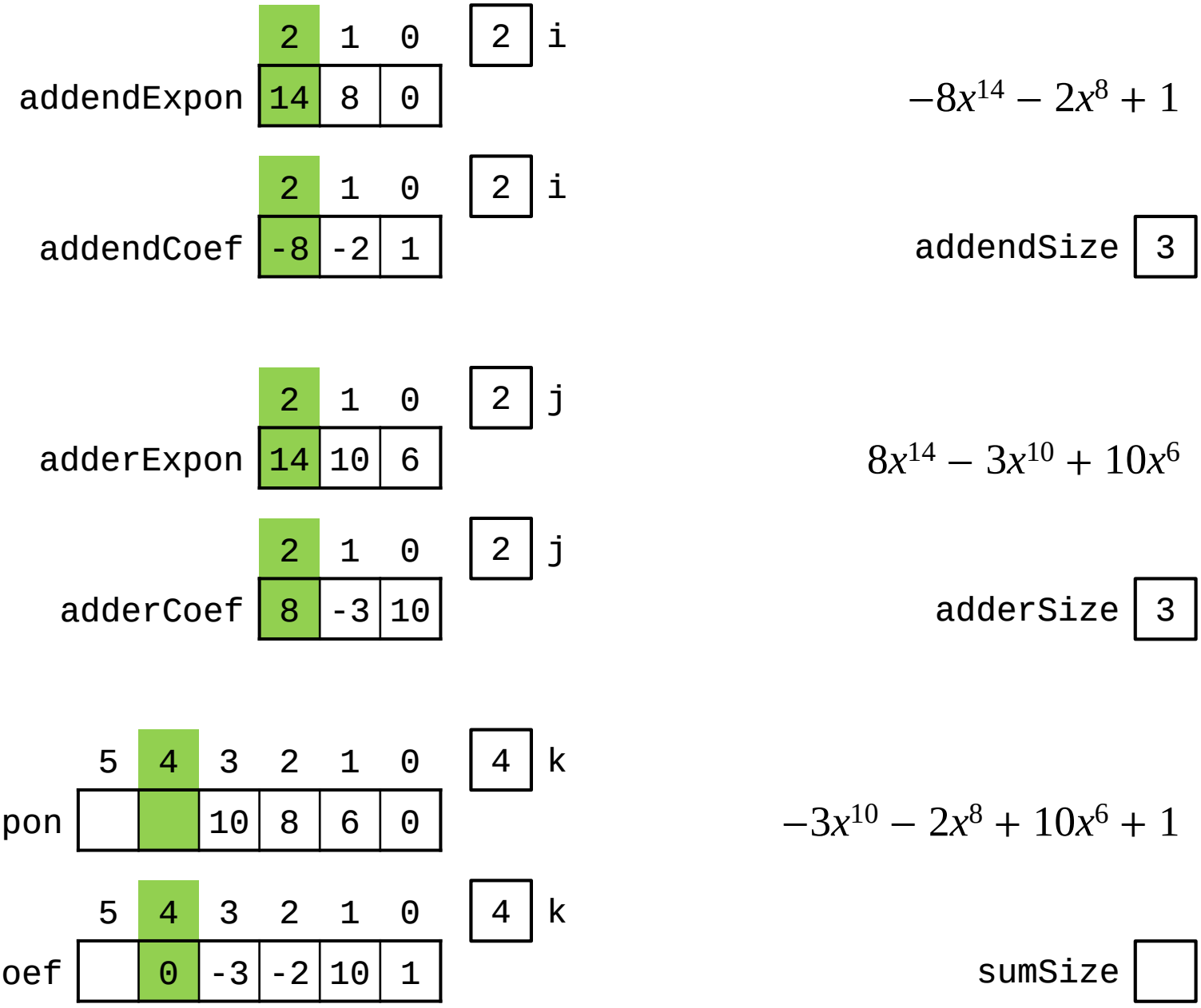
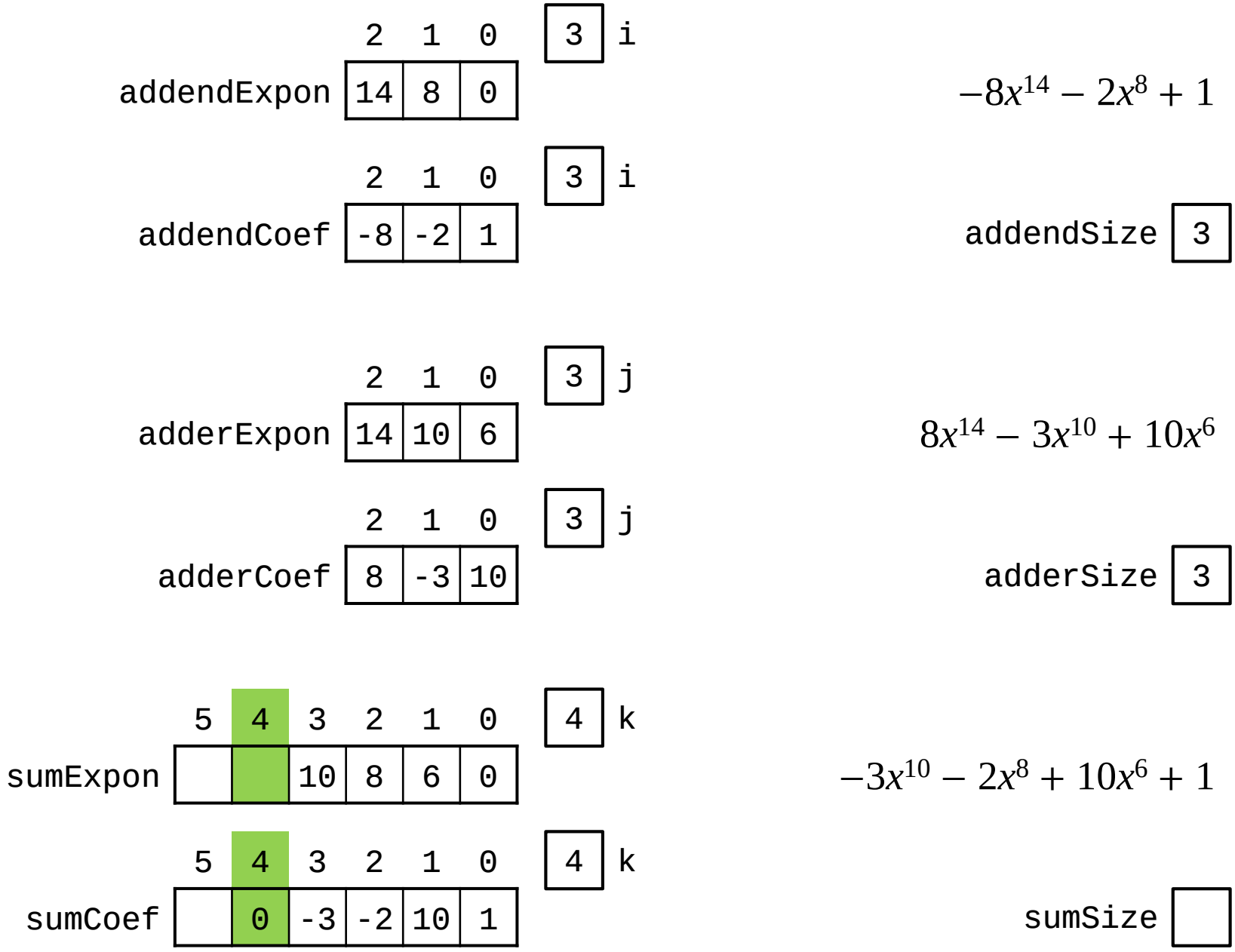
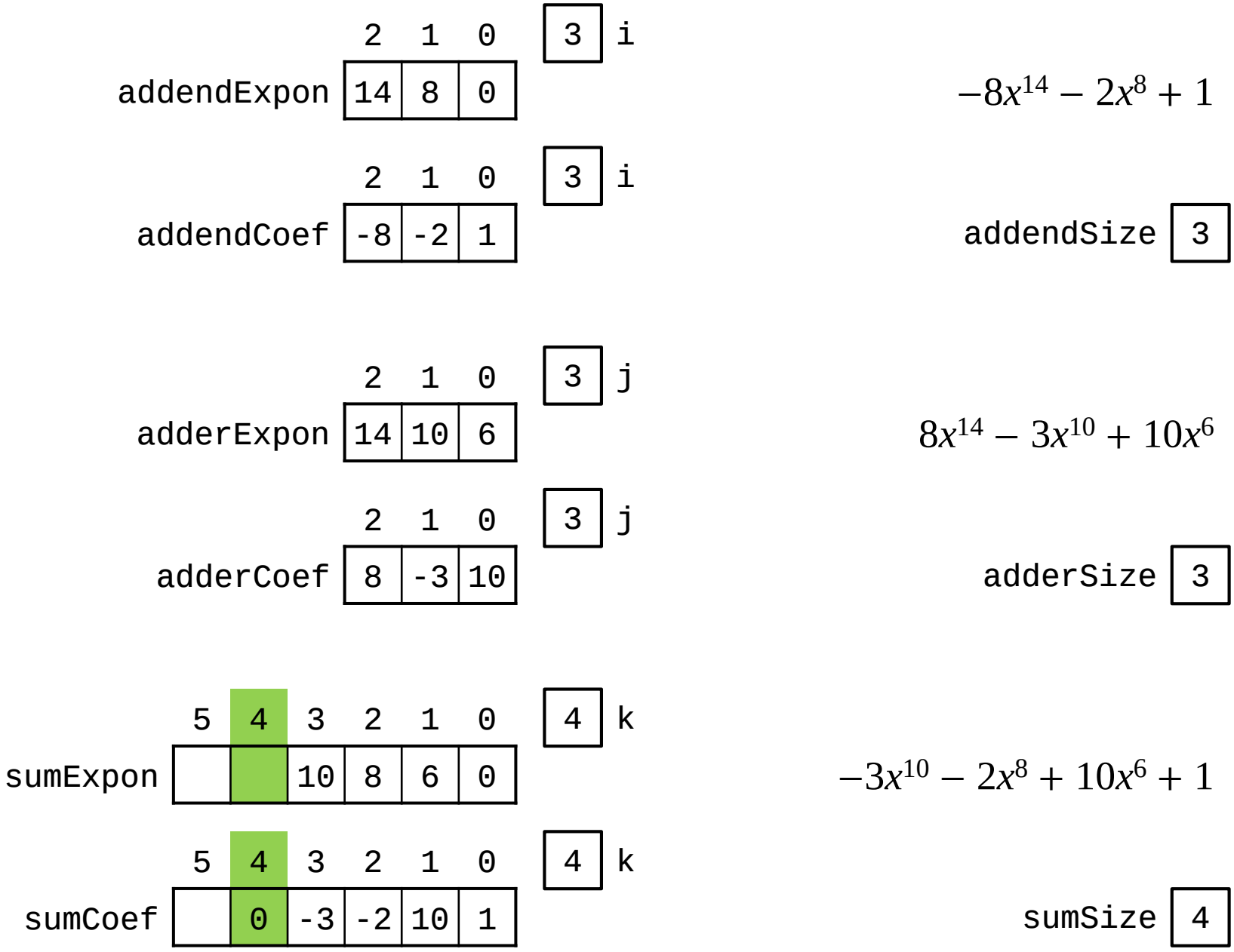
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
3 k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
3 k
sumCoef
-3 -2 10 1
sumSize


2 1 0
2 i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
2 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
2 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
4 k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4 k
sumCoef
-3 -2 10 1
sumSize


2 1 0
2 i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
2 i
addendCoef
-8 -2 1
addendSize 3
2 1 0
2 j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
2 j
adderCoef
8 -3 10
adderSize 3
5 4 3 2 1 0
4 k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4 k
sumCoef
0 -3 -2 10 1
sumSize


2 1 0
3
i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
3
i
addendCoef
-8 -2 1
addendSize
3
2 1 0
3
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
3
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
4
k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4
k
sumCoef
0 -3 -2 10 1
sumSize


2 1 0
3
i
addendExpon
14 8 0
$-8x^{14} - 2x^8 + 1$
2 1 0
3
i
addendCoef
-8 -2 1
addendSize
3
2 1 0
3
j
adderExpon
14 10 6
$8x^{14} - 3x^{10} + 10x^6$
2 1 0
3
j
adderCoef
8 -3 10
adderSize
3
5 4 3 2 1 0
4
k
sumExpon
10 8 6 0
$-3x^{10} - 2x^8 + 10x^6 + 1$
5 4 3 2 1 0
4
k
sumCoef
0 -3 -2 10 1
sumSize
4

Multiplication

```
product = 0;
if( multiplicand != 0 && multiplier != 0 )
   for( int i = 0; i < multiplierSize; i++ )
   {
       buffer = multiplier[ i ] * multiplicand
       product += buffer;
   }
```

	2	1	0
multiplicandExpon	14	8	2
multiplicandCoef	3	-2	1

$3x^{14} - 2x^{8} + x^{2}$

multiplicandSize | 3 |

	2	1	0
multiplierExpon	16	10	4
multiplierCoef	2	2	2

$2x^{16} + 2x^{10} + 2x^{4}$

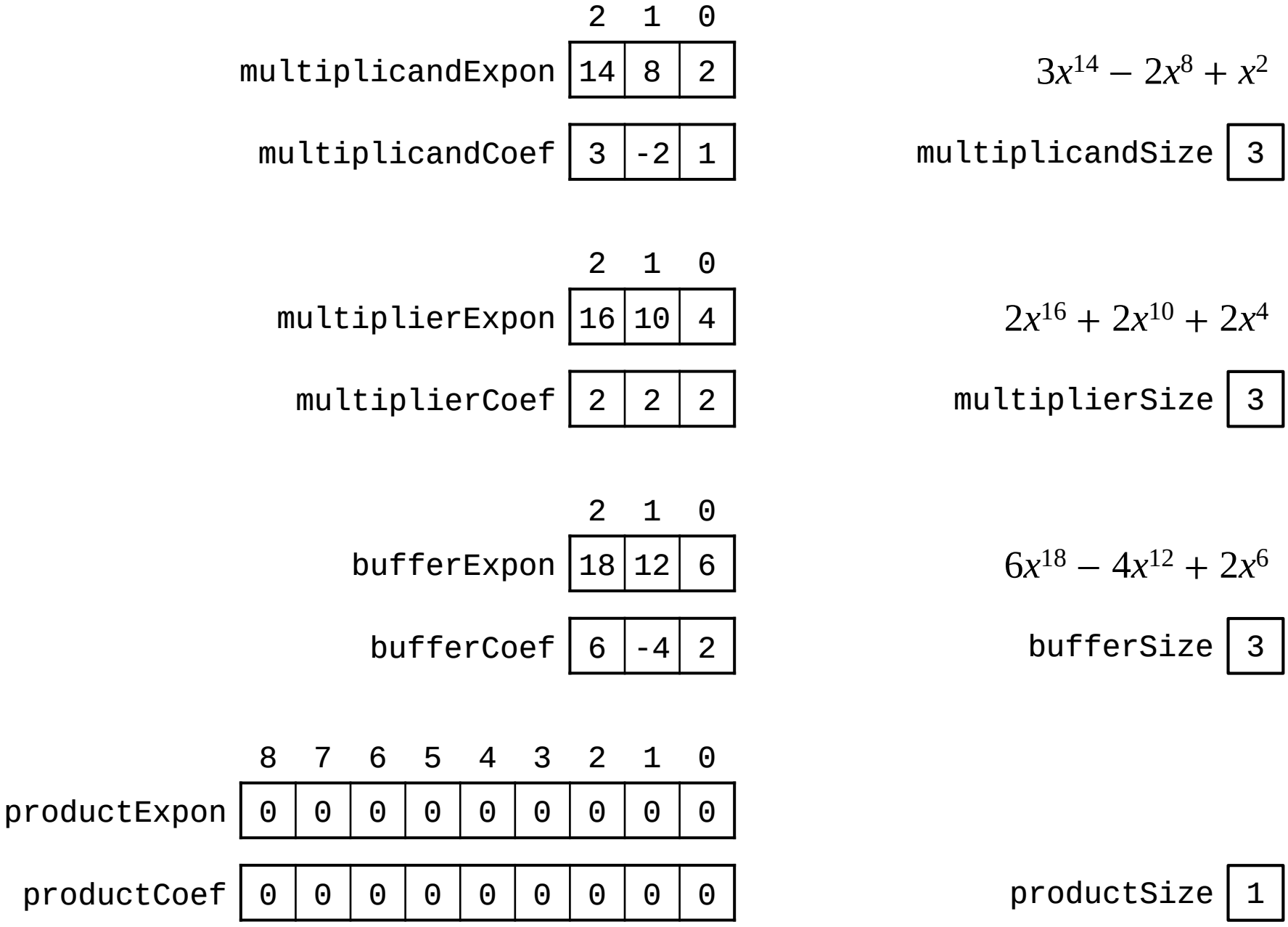
multiplierSize | 3 |

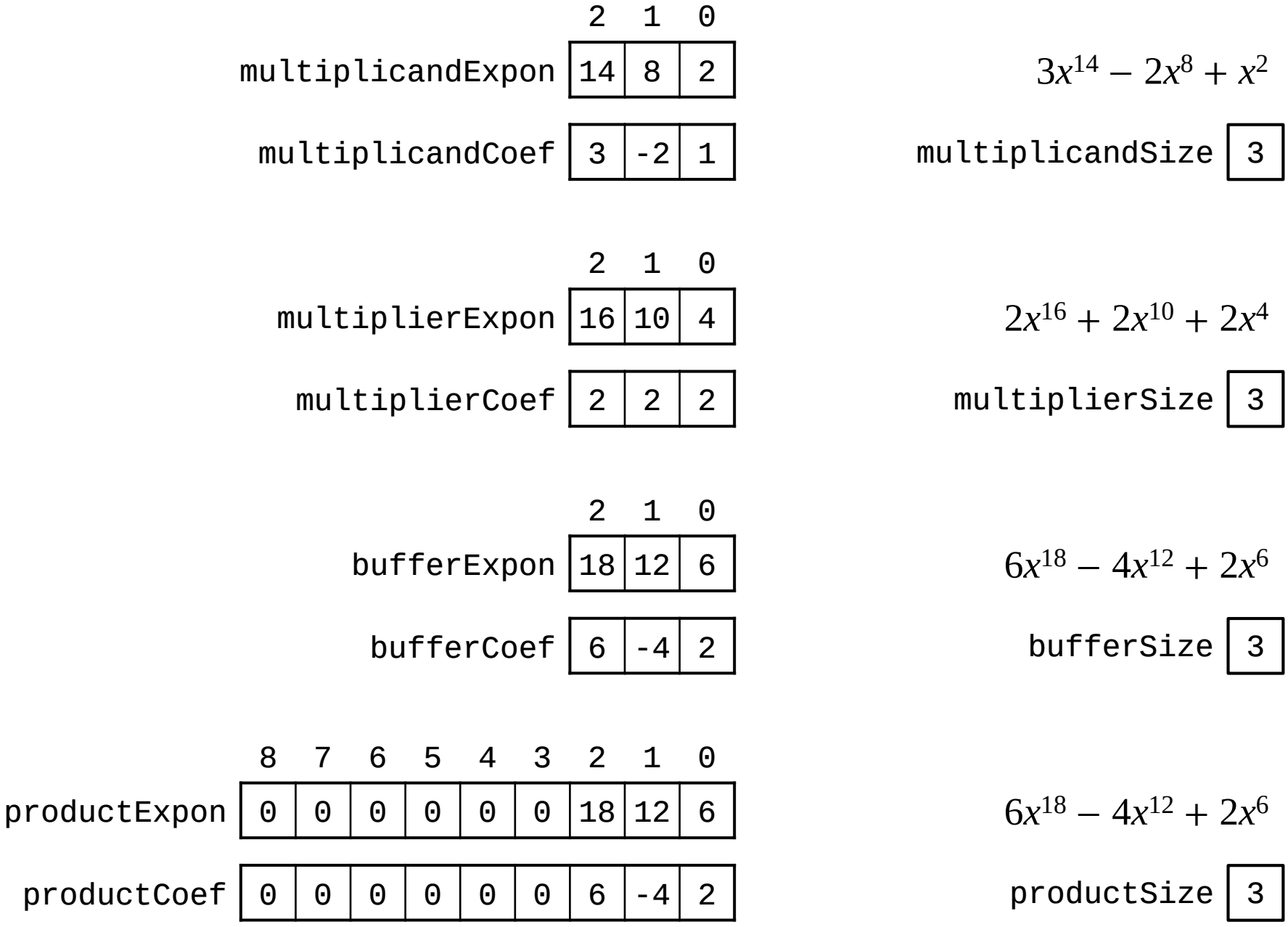
	2	1	0
bufferExpon	0	0	0
bufferCoef	0	0	0

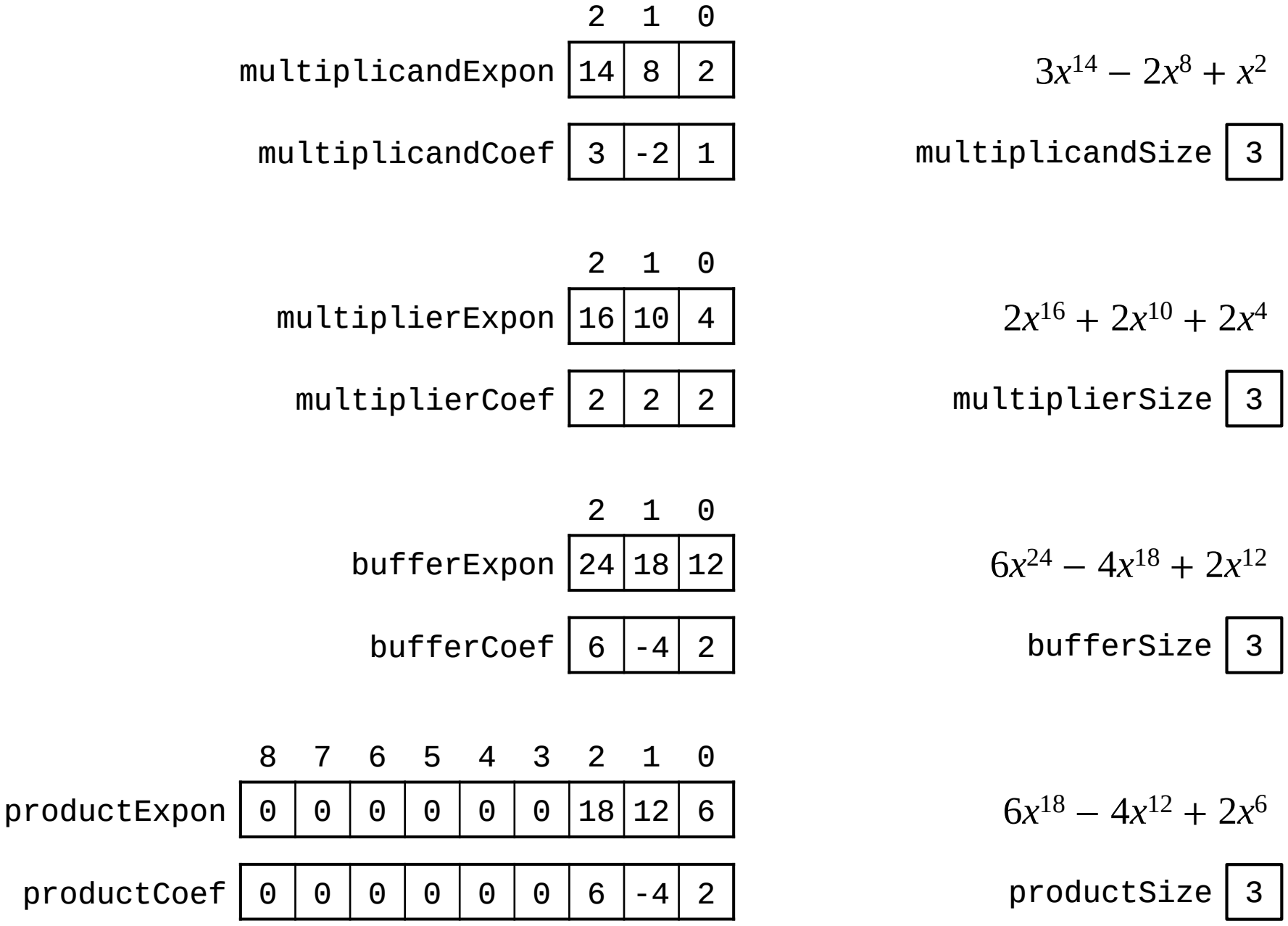
bufferSize | 3 |

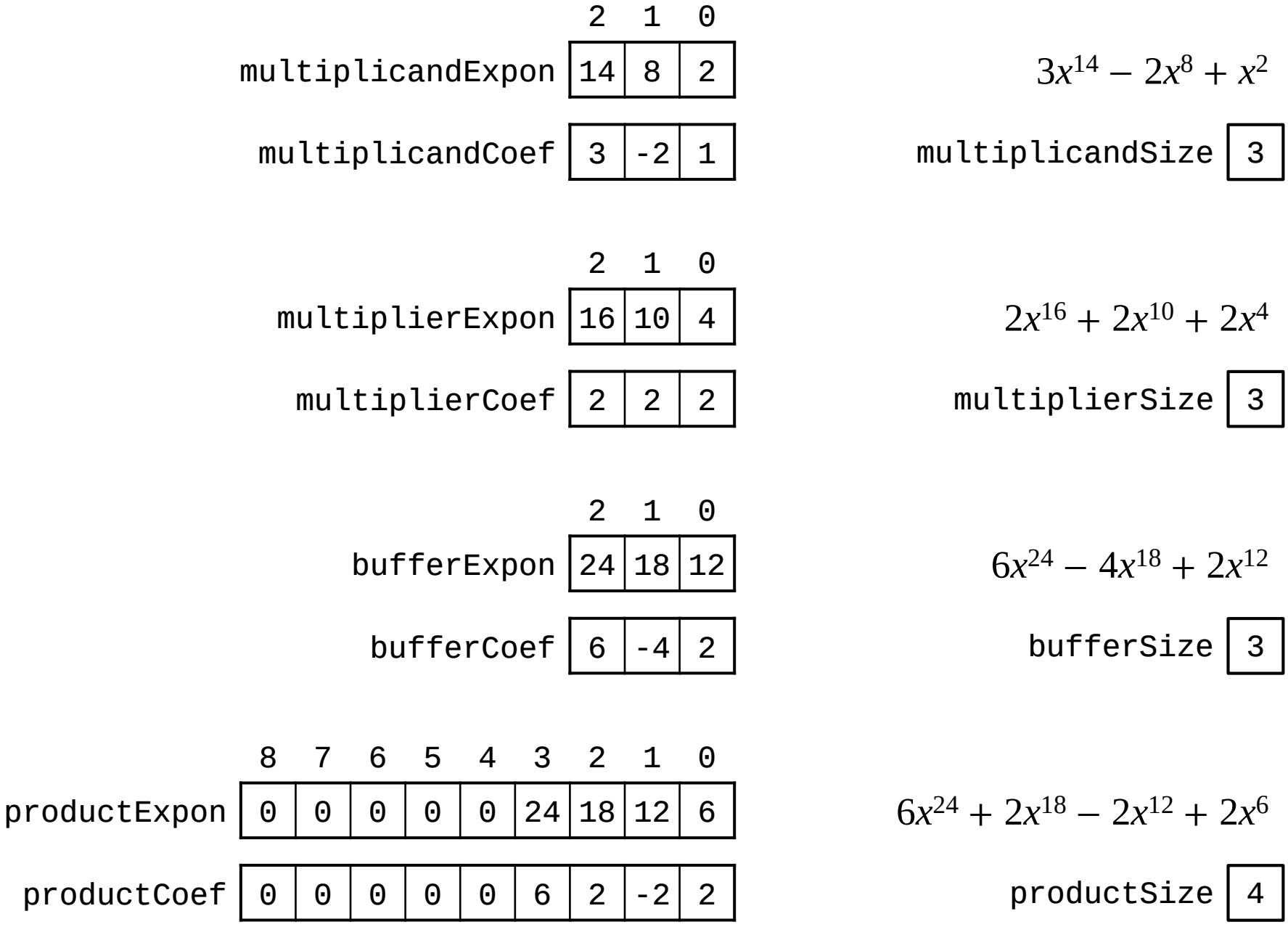
	8	7	6	5	4	3	2	1	0
productExpon	0	0	0	0	0	0	0	0	0
productCoef	0	0	0	0	0	0	0	0	0

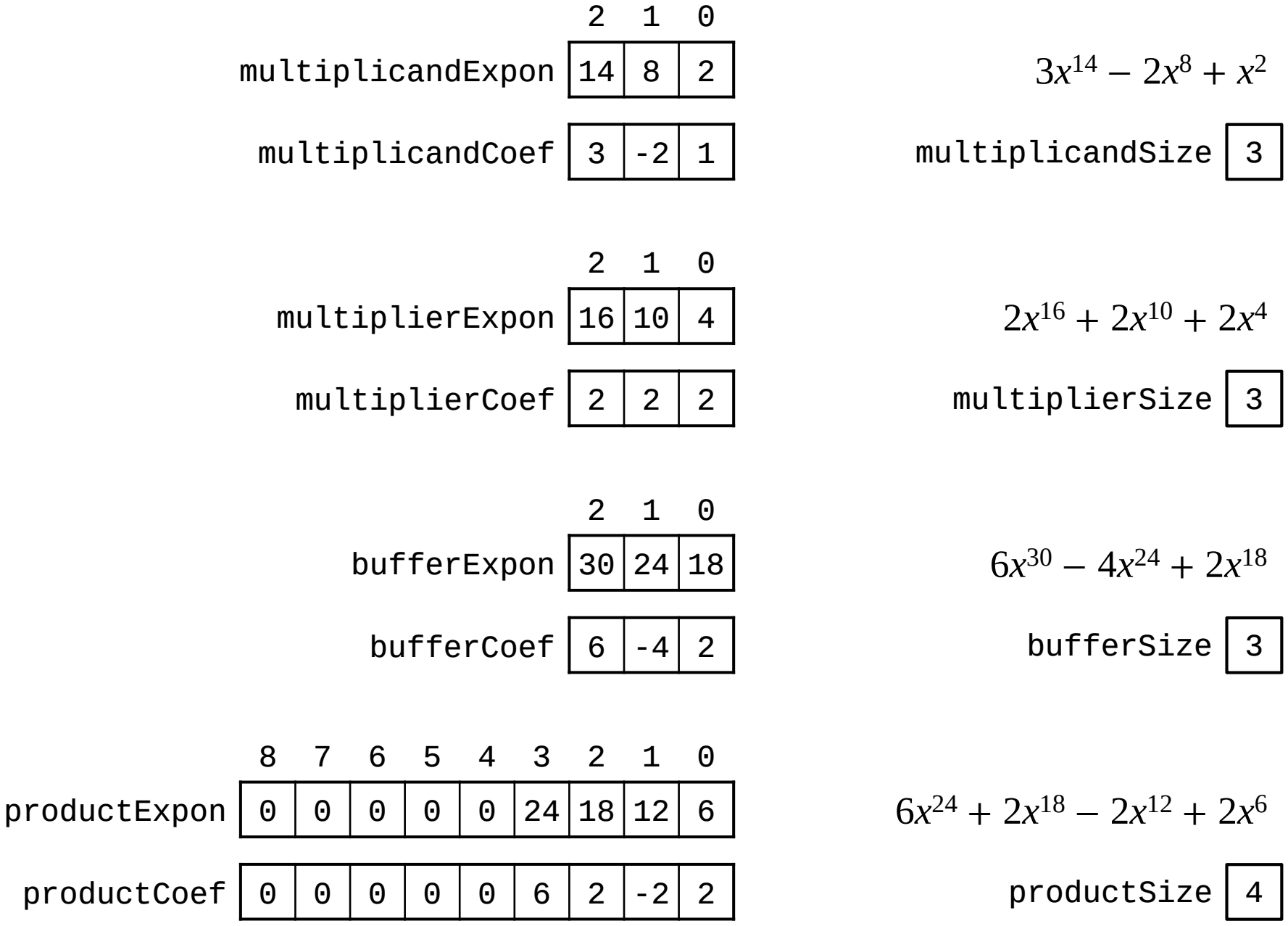
productSize | 1 |

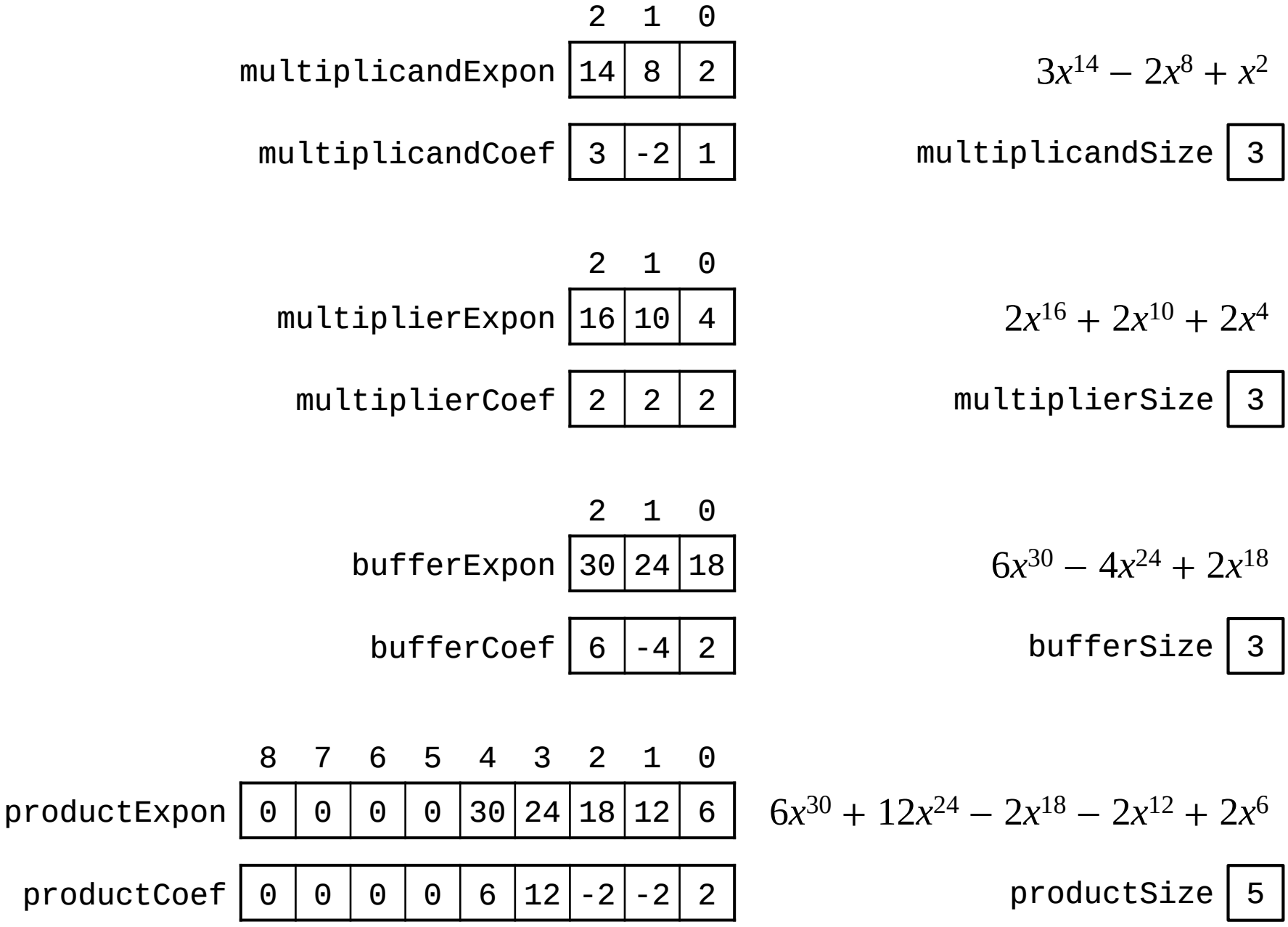

2 1 0
multiplicandExpon
14 8 2
multiplicandCoef
3 -2 1
$3x^{14} - 2x^8 + x^2$
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
multiplierCoef
2 2 2
$2x^{16} + 2x^{10} + 2x^4$
multiplierSize
3
2 1 0
bufferExpon
18 12 6
bufferCoef
6 -4 2
$6x^{18} - 4x^{12} + 2x^6$
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 0 0 0 0 0
productCoef
0 0 0 0 0 0 0 0 0
productSize
1


2 1 0
multiplicandExpon
14 8 2
multiplicandCoef
3 -2 1
$3x^{14} - 2x^8 + x^2$
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
multiplierCoef
2 2 2
$2x^{16} + 2x^{10} + 2x^4$
multiplierSize
3
2 1 0
bufferExpon
18 12 6
bufferCoef
6 -4 2
$6x^{18} - 4x^{12} + 2x^6$
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 0 0 18 12 6
productCoef
0 0 0 0 0 0 6 -4 2
$6x^{18} - 4x^{12} + 2x^6$
productSize
3


2 1 0
multiplicandExpon
14 8 2
multiplicandCoef
3 -2 1
$3x^{14} - 2x^8 + x^2$
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
multiplierCoef
2 2 2
$2x^{16} + 2x^{10} + 2x^4$
multiplierSize
3
2 1 0
bufferExpon
24 18 12
bufferCoef
6 -4 2
$6x^{24} - 4x^{18} + 2x^{12}$
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 0 0 18 12 6
productCoef
0 0 0 0 0 0 6 -4 2
$6x^{18} - 4x^{12} + 2x^6$
productSize
3

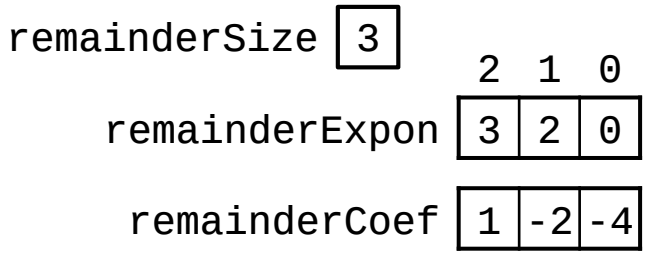

2 1 0
multiplicandExpon
14 8 2
multiplicandCoef
3 -2 1
$3x^{14} - 2x^8 + x^2$
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
multiplierCoef
2 2 2
$2x^{16} + 2x^{10} + 2x^4$
multiplierSize
3
2 1 0
bufferExpon
24 18 12
bufferCoef
6 -4 2
$6x^{24} - 4x^{18} + 2x^{12}$
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 0 24 18 12 6
productCoef
0 0 0 0 0 6 2 -2 2
$6x^{24} + 2x^{18} - 2x^{12} + 2x^6$
productSize
4


2 1 0
multiplicandExpon
14 8 2
multiplicandCoef
3 -2 1
$3x^{14} - 2x^8 + x^2$
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
multiplierCoef
2 2 2
$2x^{16} + 2x^{10} + 2x^4$
multiplierSize
3
2 1 0
bufferExpon
30 24 18
bufferCoef
6 -4 2
$6x^{30} - 4x^{24} + 2x^{18}$
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 0 24 18 12 6
productCoef
0 0 0 0 0 6 2 -2 2
$6x^{24} + 2x^{18} - 2x^{12} + 2x^6$
productSize
4

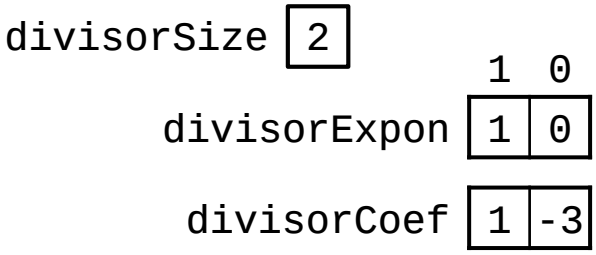

2 1 0
multiplicandExpon
14 8 2
$3x^{14} - 2x^8 + x^2$
multiplicandCoef
3 -2 1
multiplicandSize
3
2 1 0
multiplierExpon
16 10 4
$2x^{16} + 2x^{10} + 2x^4$
multiplierCoef
2 2 2
multiplierSize
3
2 1 0
bufferExpon
30 24 18
$6x^{30} - 4x^{24} + 2x^{18}$
bufferCoef
6 -4 2
bufferSize
3
8 7 6 5 4 3 2 1 0
productExpon
0 0 0 0 30 24 18 12 6
$6x^{30} + 12x^{24} - 2x^{18} - 2x^{12} + 2x^6$
productCoef
0 0 0 0 6 12 -2 -2 2
productSize
5

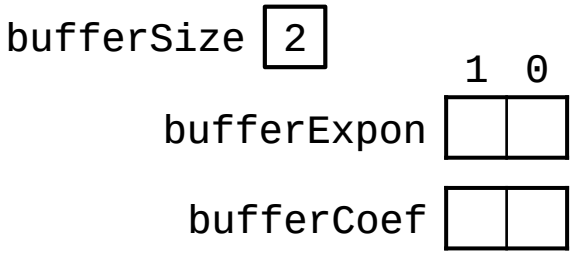
Division

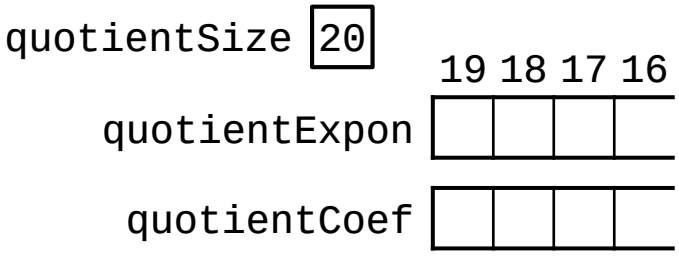
```
remainder = dividend;
quotientSize = arraySize;
int bufferSize = divisorSize;
int i;
for( i = quotientSize - 1; i >= 0; i-- )
{
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                        divisor[ divisorSize - 1 ];

   buffer = divisor * quotient[ i ];
   if( remainder == buffer )
   {
      remainder = 0;
      break;
   }

   remainder -= buffer

   if( the degree of remainder < the degree of divisor )
      break;
}

right shift quotient over i positions (terms);
```



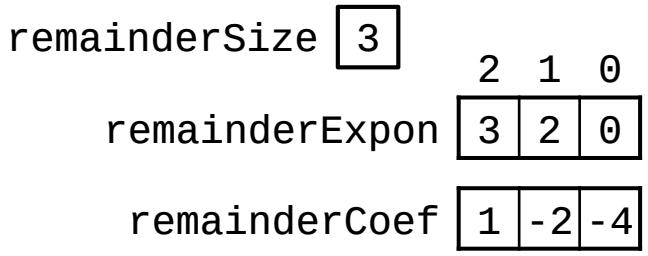
$$x - 3 \overline{)\ x^3 - 2x^2 + 0x - 4}$$



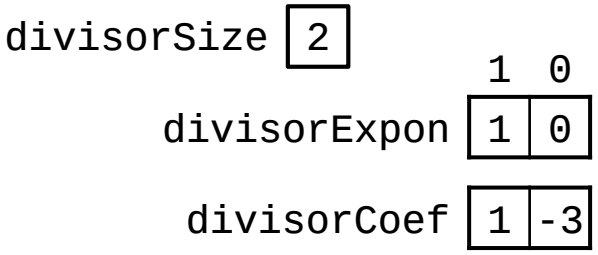


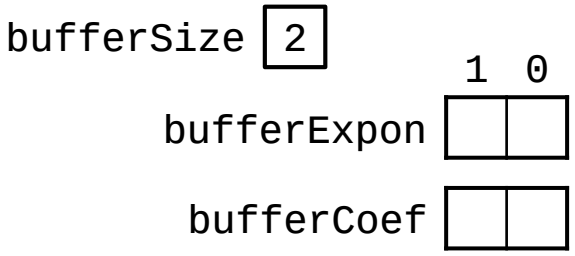


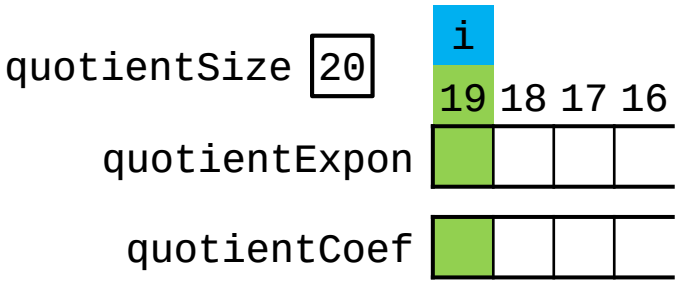

```
remainder = dividend;
quotientSize = arraySize;
int bufferSize = divisorSize;
int i;
```



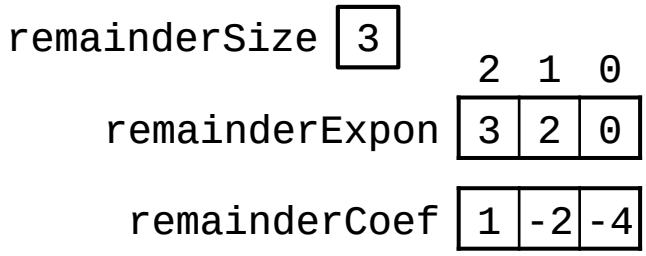
$$x - 3 \overline{)\ x^3 - 2x^2 + 0x - 4}$$





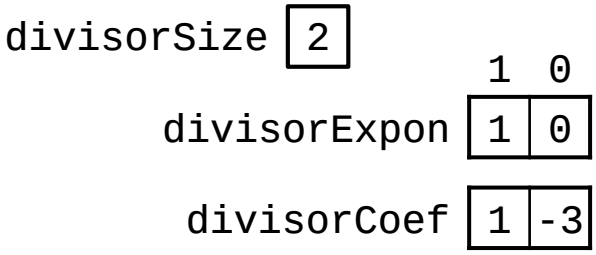


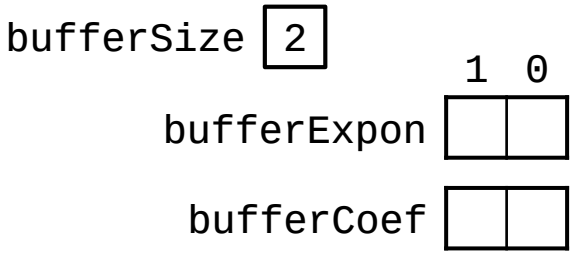

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

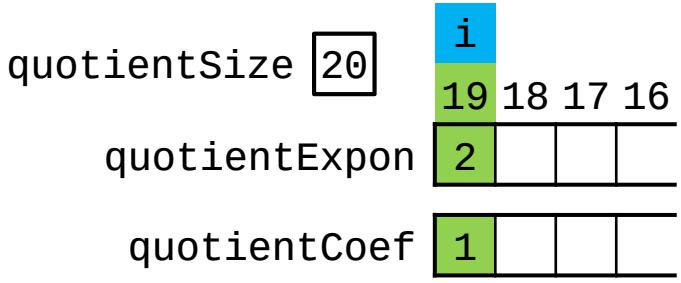


$$x - 3 \overline{)\; x^3 - 2x^2 + 0x - 4}$$

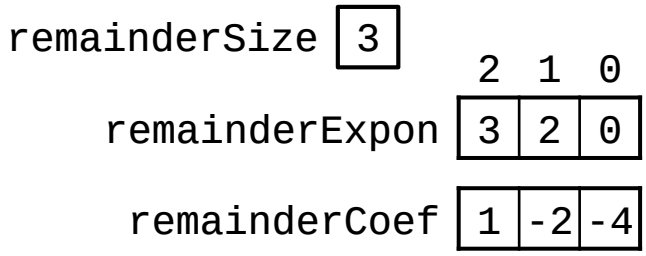
$$x^2$$



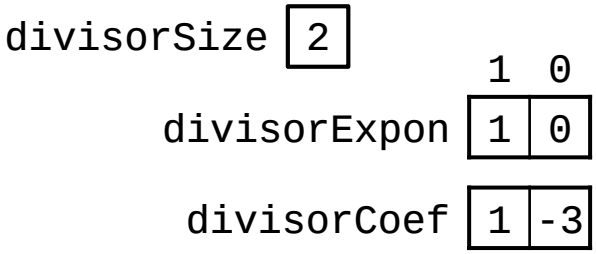


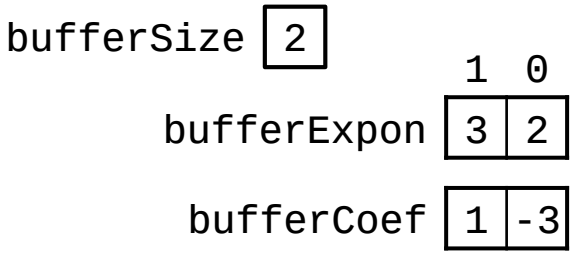


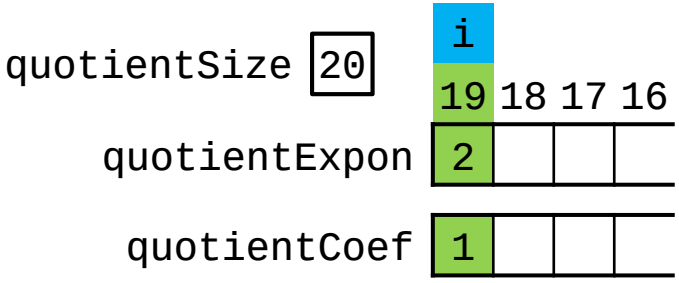

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



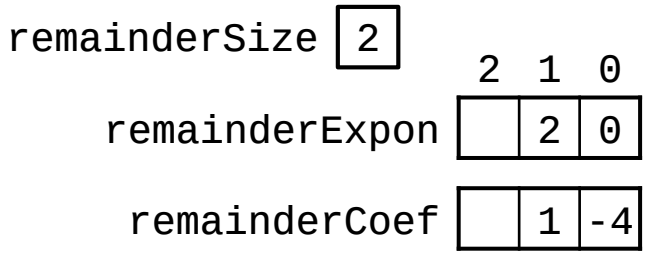
$$\begin{array}{r} x^2 \\ x-3\,\overline{)\;x^3-2x^2+0x-4} \\ \underline{x^3-3x^2} \end{array}$$



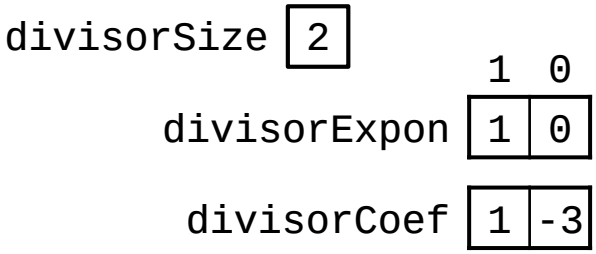


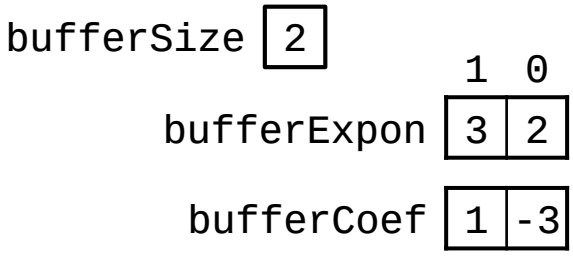


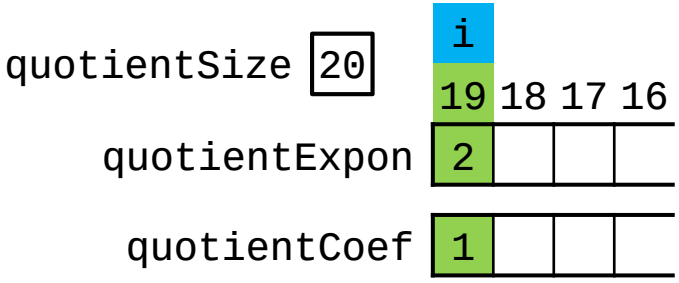

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



$$
\begin{array}{r}
x^2 \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4
\end{array}
$$








```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize	2

	2	1	0
remainderExpon		2	0
remainderCoef		1	-4

divisorSize	2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize	2

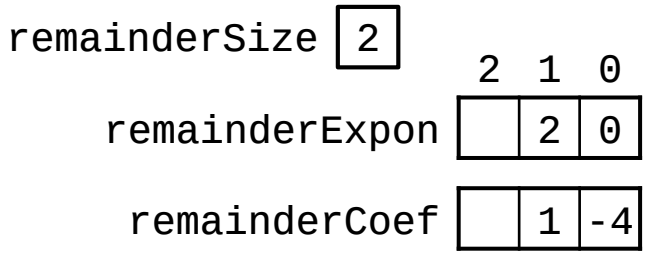
	1	0
bufferExpon	3	2
bufferCoef	1	-3

$$x - 3 \overline{)\; x^3 - 2x^2 + 0x - 4}$$
$$x^2 + x$$
$$x^3 - 3x^2$$
$$x^2 + 0x - 4$$

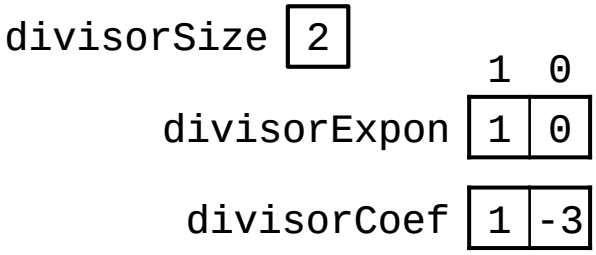
quotientSize	20

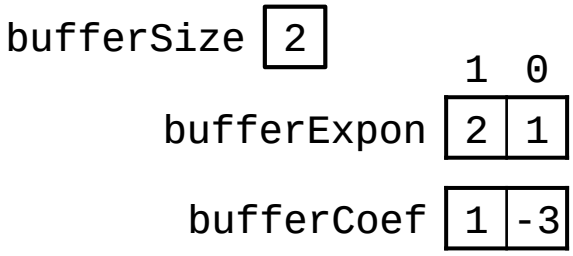
	i			
	19	18	17	16
quotientExpon	2	1		
quotientCoef	1	1		

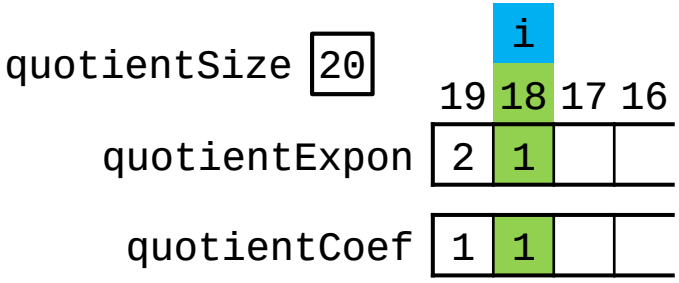
```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



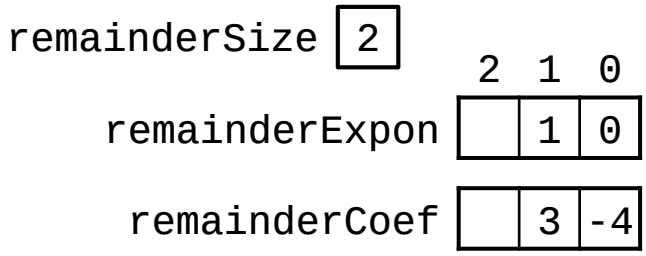
$$
\begin{array}{r}
x^2 + x \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4 \\
\underline{x^2 - 3x}
\end{array}
$$

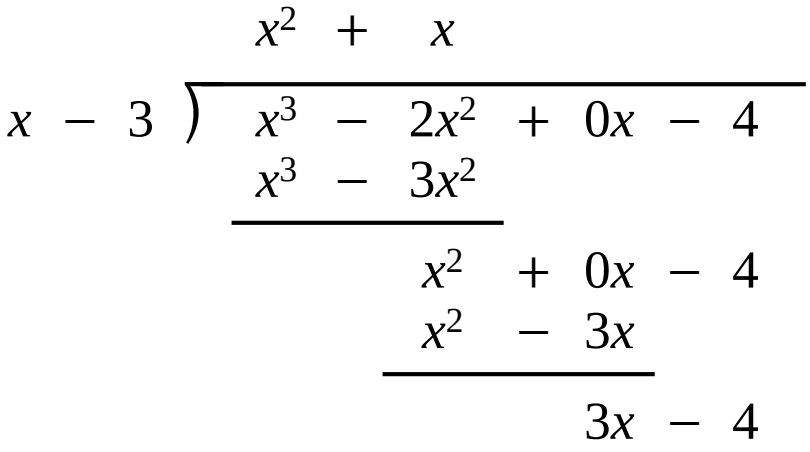


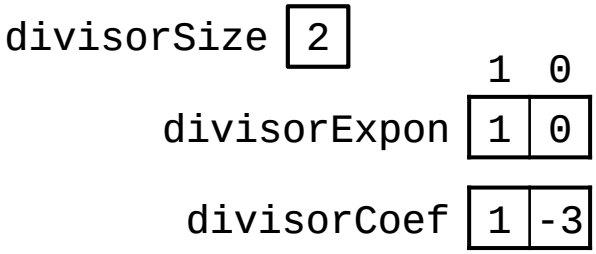


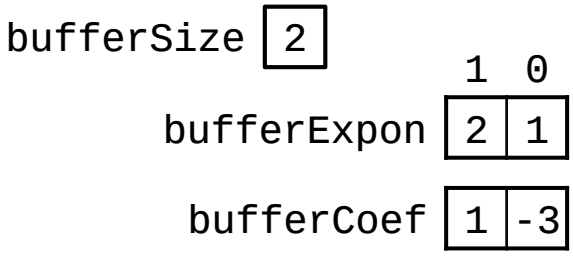


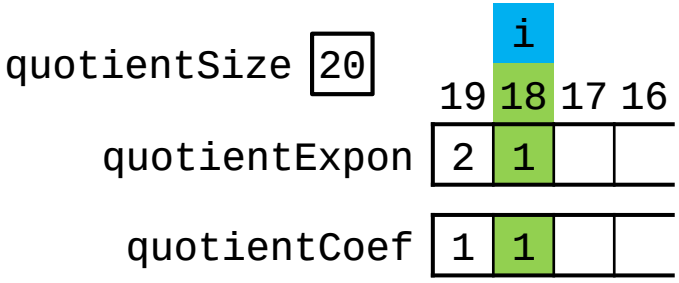

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



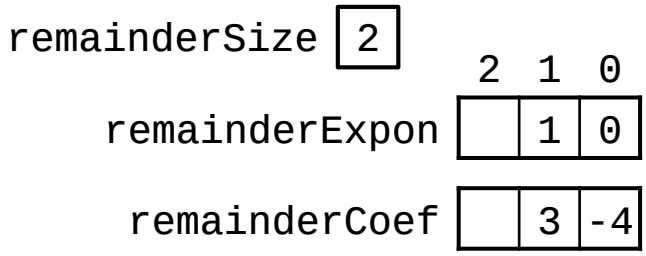




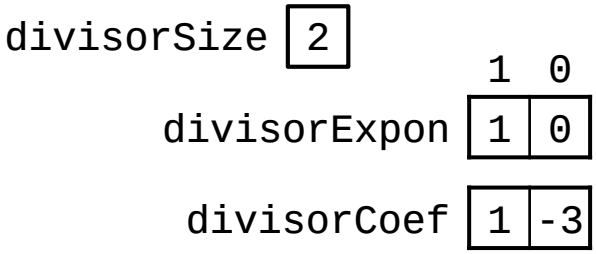


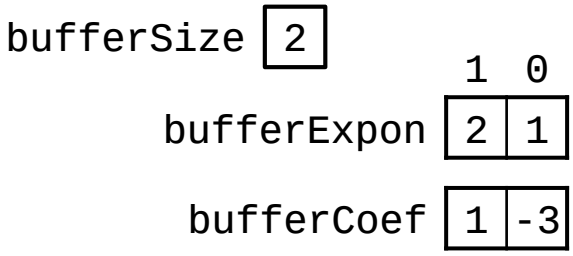


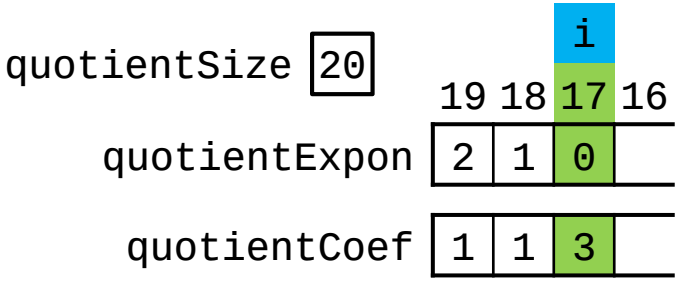

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



$$
\begin{array}{r}
x^2 + x + 3 \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4 \\
\underline{x^2 - 3x} \\
3x - 4
\end{array}
$$








```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize 2

	2	1	0
remainderExpon		1	0
remainderCoef		3	-4

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

	1	0
bufferExpon	1	0
bufferCoef	3	-9

$$
\begin{array}{r|l}
x - 3 & x^2 + x + 3 \\
\hline
 & x^3 - 2x^2 + 0x - 4 \\
 & \underline{x^3 - 3x^2} \\
 & \quad x^2 + 0x - 4 \\
 & \quad \underline{x^2 - 3x} \\
 & \qquad 3x - 4 \\
 & \qquad 3x - 9
\end{array}
$$

quotientSize 20

	i			
	19	18	17	16
quotientExpon	2	1	0	
quotientCoef	1	1	3	

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize 1

	2	1	0
remainderExpon			0
remainderCoef			5

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

	1	0
bufferExpon	1	0
bufferCoef	3	-9

$$
\begin{array}{r}
x^2 + x + 3 \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4 \\
\underline{x^2 - 3x} \\
3x - 4 \\
\underline{3x - 9} \\
5
\end{array}
$$

quotientSize 20

	19	18	i = 17	16
quotientExpon	2	1	0	
quotientCoef	1	1	3	

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize 1

	3	2	1	0
remainderExpon				0
remainderCoef				5

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

	1	0
bufferExpon	1	0
bufferCoef	3	-9

$$
\begin{array}{r}
x^2 + x + 3 \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4 \\
\underline{x^2 - 3x} \\
3x - 4 \\
\underline{3x - 9} \\
5
\end{array}
$$

quotientSize 20

	19	18	i = 17	16
quotientExpon	2	1	0	
quotientCoef	1	1	3	

```
    if( the degree of remainder < the degree of divisor )
        break;
}

right shift quotient over i positions (terms);
```

remainderSize 1

	3	2	1	0
remainderExpon				0
remainderCoef				5

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

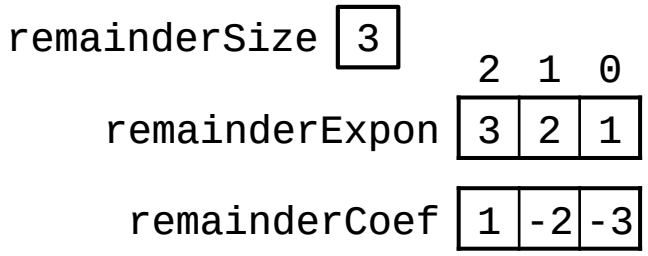
	1	0
bufferExpon	1	0
bufferCoef	3	-9

$$
\begin{array}{r}
x^2 + x + 3 \\
x - 3 \;\overline{)\; x^3 - 2x^2 + 0x - 4} \\
\underline{x^3 - 3x^2} \\
x^2 + 0x - 4 \\
\underline{x^2 - 3x} \\
3x - 4 \\
\underline{3x - 9} \\
5
\end{array}
$$

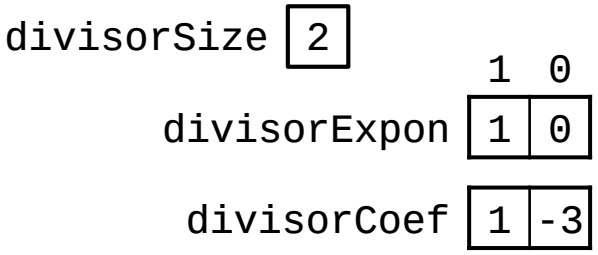
quotientSize 3

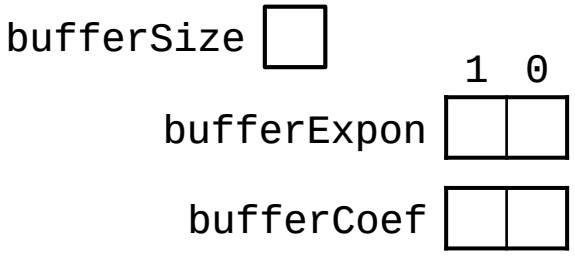
	2	1	i = 0
quotientExpon	2	1	0
quotientCoef	1	1	3

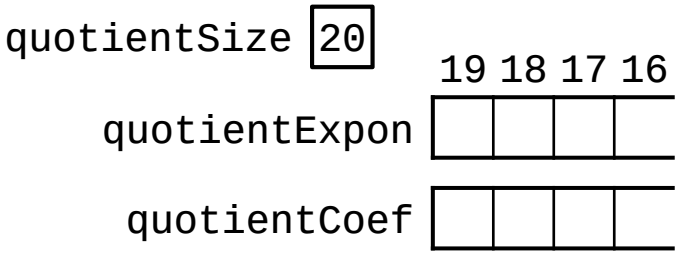
```
    if( the degree of remainder < the degree of divisor )
        break;
}

right shift quotient over i positions (terms);
```



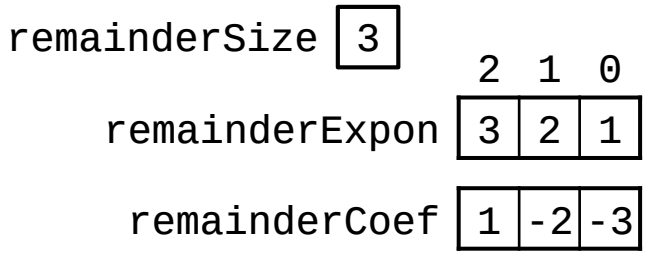
$$x - 3 \overline{)\ x^3 - 2x^2 - 3x}$$



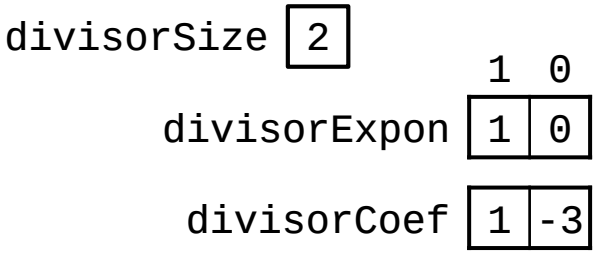


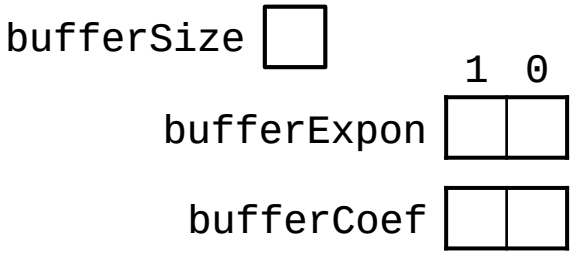


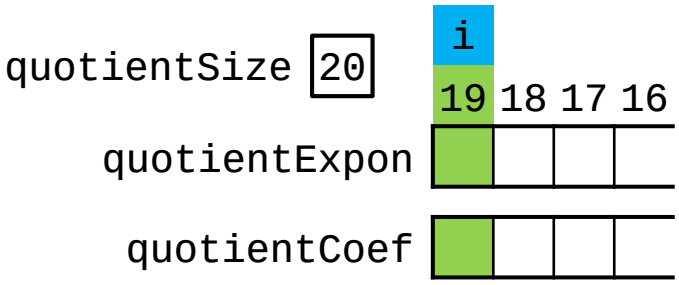

```
remainder = dividend;
quotientSize = arraySize;
int bufferSize = divisorSize;
int i;
```



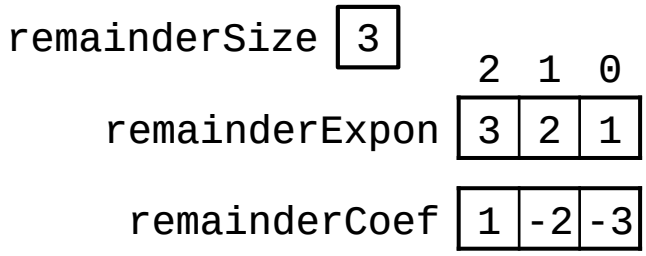
$$x - 3 \overline{)\ x^3 - 2x^2 - 3x}$$



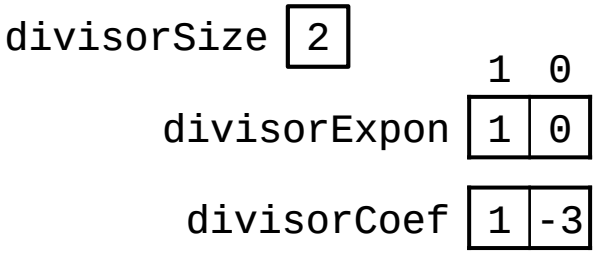


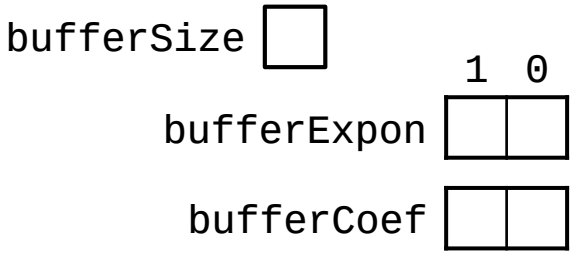


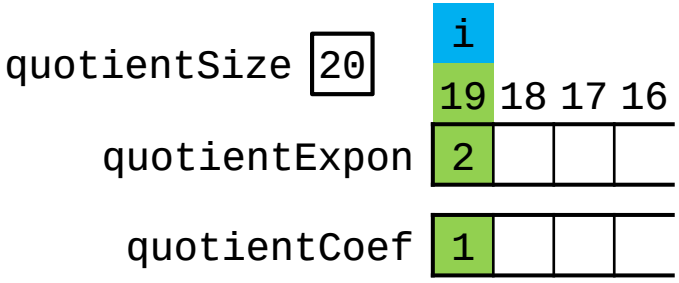

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



$$x - 3 \overline{)\; x^3 - 2x^2 - 3x \;}\; x^2$$








```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize	3

	2	1	0
remainderExpon	3	2	1
remainderCoef	1	-2	-3

divisorSize	2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

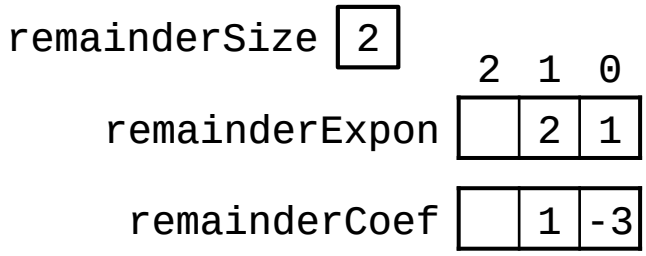
bufferSize	2

	1	0
bufferExpon	3	2
bufferCoef	1	-3

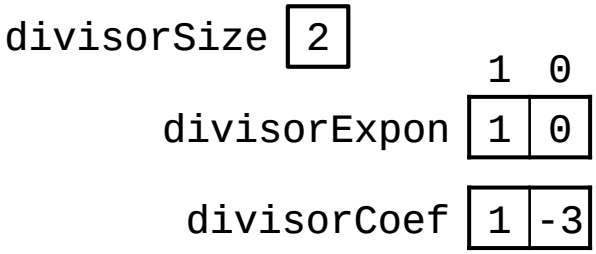
$$x - 3 \overline{)\; x^3 - 2x^2 - 3x}$$
$$\qquad\quad x^3 - 3x^2$$
$$\qquad\quad\quad\;\; x^2$$

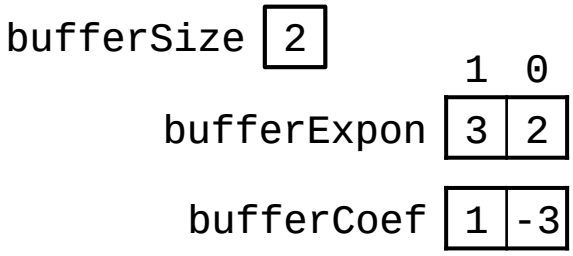
quotientSize	20	i			
		19	18	17	16
quotientExpon		2			
quotientCoef		1			

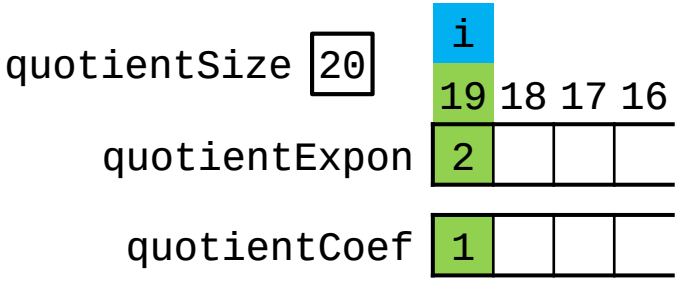
```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



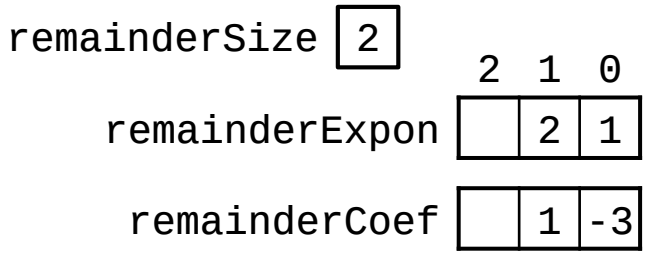
$$x - 3 \overline{)\; x^3 - 2x^2 - 3x}$$
$$\quad x^2$$
$$\quad x^3 - 3x^2$$
$$\quad\quad x^2 - 3x$$



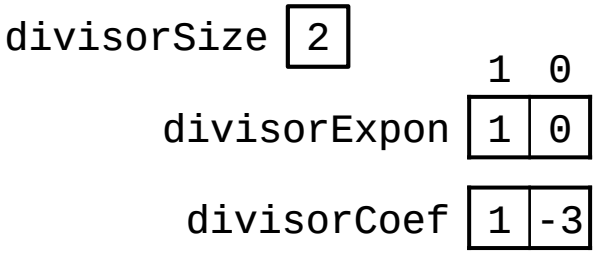


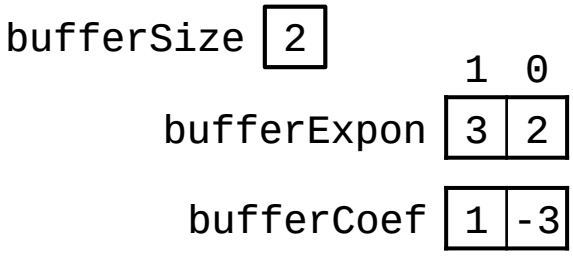


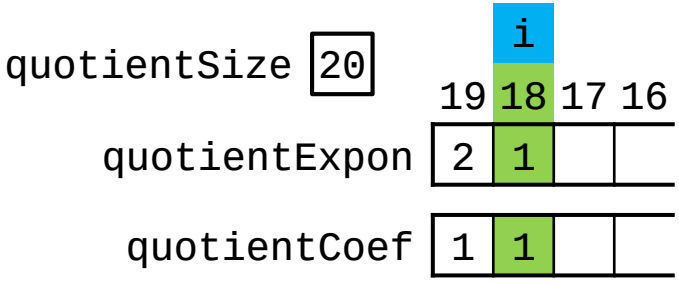

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



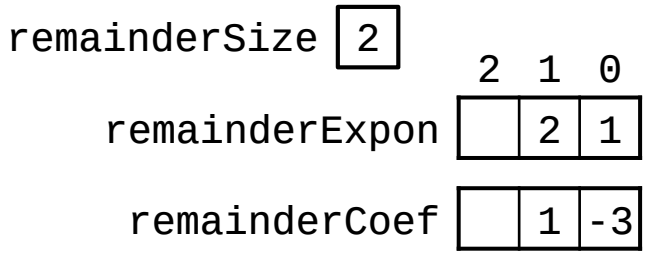
$$
\begin{array}{r}
x^2 + x \\
x - 3 \;\overline{)\; x^3 - 2x^2 - 3x} \\
\underline{x^3 - 3x^2} \\
x^2 - 3x
\end{array}
$$



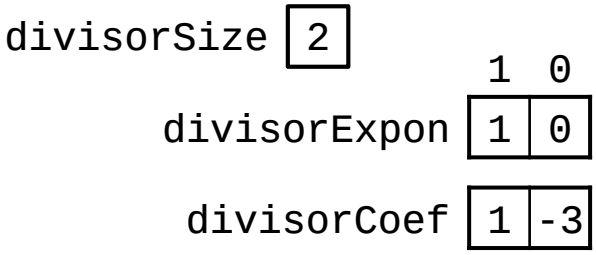


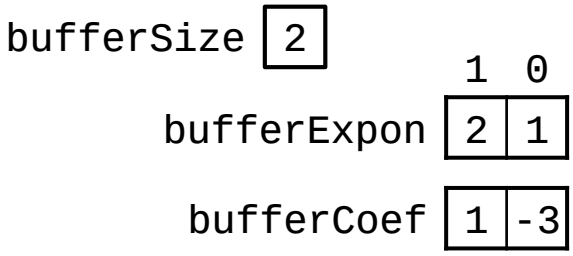


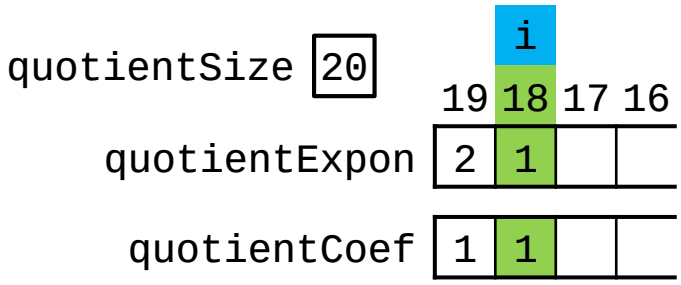

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```



$$
\begin{array}{r}
x^2 + x \\
x - 3 \;\overline{)\; x^3 - 2x^2 - 3x} \\
\underline{x^3 - 3x^2} \\
x^2 - 3x \\
\underline{x^2 - 3x}
\end{array}
$$








```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize 1

	2	1	0
remainderExpon			0
remainderCoef			0

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

	1	0
bufferExpon	2	1
bufferCoef	1	-3

$$
\begin{array}{r}
x^2 + x \\
x - 3 \;\overline{)\; x^3 - 2x^2 - 3x} \\
\underline{x^3 - 3x^2} \\
x^2 - 3x \\
\underline{x^2 - 3x} \\
0
\end{array}
$$

quotientSize 20

	i			
	19	18	17	16
quotientExpon	2	1		
quotientCoef	1	1		

```
for( i = quotientSize - 1; i >= 0; i-- ) {
   quotient[ i ] = remainder[ remainderSize - 1 ] /
                   divisor[ divisorSize - 1 ];
   buffer = divisor * quotient[ i ];
   if( remainder == buffer ) {
      remainder = 0;  break;
   }
   remainder -= buffer;
```

remainderSize 1

	2	1	0
remainderExpon			0
remainderCoef			0

divisorSize 2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize 2

	1	0
bufferExpon	2	1
bufferCoef	1	-3

$$
\begin{array}{r|l}
 & x^2 + x \\
\hline
x - 3 & x^3 - 2x^2 - 3x \\
 & \underline{x^3 - 3x^2} \\
 & \quad x^2 - 3x \\
 & \underline{x^2 - 3x} \\
 & \quad 0
\end{array}
$$

quotientSize 20

	i			
	19	18	17	16
quotientExpon	2	1		
quotientCoef	1	1		

```
    if( the degree of remainder < the degree of divisor )
        break;
}

right shift quotient over i positions (terms);
```

remainderSize	1

	2	1	0
remainderExpon			0
remainderCoef			0

divisorSize	2

	1	0
divisorExpon	1	0
divisorCoef	1	-3

bufferSize	2

	1	0
bufferExpon	2	1
bufferCoef	1	-3

quotientSize	2

	1	0
quotientExpon	2	1
quotientCoef	1	1

$$
\begin{array}{r}
x^2 + x \\
x - 3 \;\overline{)\; x^3 - 2x^2 - 3x} \\
\underline{x^3 - 3x^2} \\
x^2 - 3x \\
\underline{x^2 - 3x} \\
0
\end{array}
$$

```
    if( the degree of remainder < the degree of divisor )
       break;
  }

  right shift quotient over i positions (terms);
```